Learning off the record

On the what, why and how of teachers' informal learning

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Antoine R. LECAT

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Promoteurs

Prof. Isabel RAEMDONCK (UCLouvain)
Prof. Simon BEAUSAERT (Maastricht University, Netherlands)

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Présidente du jury

Prof. Mariane FRENAY (UCLouvain)

Comité d'accompagnement et jury

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Résumé

Les activités informelles d'apprentissage sur le lieu de travail sont essentielles au développement professionnel des enseignants. Une revue de littérature systématique fait l'état des lieux du sujet, une étude qualitative met en avant la perception qu'ont les enseignants de leurs activités informelles d'apprentissage et deux études empiriques révèlent les liens quantitatifs qu'entretiennent les activités informelles sociales des enseignants avec le climat scolaire d'apprentissage d'une part et d'autre part les compétences d'employabilité et les comportements d'innovation au travail.

Abstract

Teachers' workplace learning, and especially informal learning activities, is essential for professional development. A systematic literature review maps the current state of the field of study, a qualitative study highlights teachers' perceptions of their informal learning activities and two empirical studies reveal the quantitative links between teachers' informal social activities and the school learning climate on the one hand and employability competences and innovative work behaviours on the other hand.

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Deux arbres seront plantés pour compenser l'impression de cette thèse. Puissent-ils devenir grands et solides.

Chapitre 1

Introduction générale

Introduction générale

Afin de comprendre pleinement le choix du développement professionnel des enseignants, et en particulier leurs apprentissages informels, et l'approche dans laquelle la présente thèse se situe, il est nécessaire en premier lieu de comprendre les raisons qui placent ce sujet de recherche au centre de la littérature sur la formation des enseignants au cours des dernières années. Les enseignants sont en effet portés à se former et se développer professionnellement, comme dans toute profession, durant toute leur carrière mais sont aussi poussés à répondre aux pressions sociétales de leur responsabilité d'enseignement, à se tenir à jour des réformes et des innovations pédagogiques et à diversifier leurs pratiques (Butler, 2005). Cette pression sociale et sociétale est accentuée par une reconnaissance de la professionnalité des enseignants (Butler, 2005 ; Sugrue & Day, 2002). Cela explique l'attention sur l'apprentissage continu des enseignants et sur la nature de celui-ci depuis le début des années 90, renforcée encore par le développement de la pédagogie et des didactiques, l'essor technique des sociétés et enfin la volonté politique de permettre l'égalité des chances et de la réussite parmi tous les élèves (Kremer-Hayon, Vonk, & Fessler, 1993).

Dans le cadre de la présente thèse, le développement professionnel des enseignants sera défini comme l'ensemble des processus comprenant à la fois l'apprentissage de l'action d'enseigner et des autres pratiques professionnelles, principalement par la formation continue, la réflexivité de ses pratiques, les interactions sociales avec les pairs (Day, 1999 ; Donnay & Charlier, 2006 ; Hoekstra, Brekelmans, Beijaard, & Korthagen, 2009 ; Korthagen, 2010 ; Lieberman & Miller, 2001 ; Uwamariya & Mukamurera, 2005 ; Webster-Wright, 2009). Il est important de préciser que, en accord avec le compte-rendu de Zeph (1991), le développement professionnel des enseignants exclut leur formation initiale, puisque l'obtention du diplôme permet l'entrée dans la vie professionnelle en tant qu'enseignant. Le développement professionnel des enseignants peut parfois prendre la forme d'études complémentaires, mais ces dernières doivent être séparées de la formation initiale de l'enseignant, avant qu'il ne soit complètement un enseignant à part entière.

Cette introduction sera l'occasion de présenter notre objet d'étude et ses contours pour en dégager nos objectifs généraux et nos questions de recherche. Un aperçu des études qui construisent cette thèse sera finalement proposé.

1. Contexte et problématique

Comme mentionné plus haut, le développement professionnel des enseignants est, depuis une petite trentaine d'années, un sujet d'attention et de nombreuses études et recherches ont été produites à ce sujet. L'importance du développement professionnel continu des enseignants est triple (Kremer-Hayon, Vonk, & Fessler, 1993). Premièrement, l'évolution de la société, dans tous les domaines, les obligent à rester continuellement à jour dans les matières qu'ils enseignent. Cette mise à jour perpétuelle demande un apprentissage constant. Deuxièmement, leur responsabilité professionnelle les oblige à suivre le développement de la pédagogie, en général, et des didactiques de leurs domaines d'enseignement en particulier. Troisièmement, la pression sociale et sociétale d'excellence et les volontés politiques les poussent à diversifier leurs pratiques et à s'adapter sans cesse pour permettre à tous leurs élèves d'atteindre les meilleures chances d'émancipation et de réussite.

Le concept de développement professionnel est apparu en contexte de professionnalisation des travailleurs n'ayant pas de fonction fixe et donc voués à apprendre et évoluer durant toute leur carrière (Blackman, 1989; Kelchtermans, 2001; Le Boterf, 2001; Van der Heijden & Barbier, 1999). Parmi les auteurs ayant développé le sujet, le terme de « développement professionnel » prend des formes différentes et désigne une sélection diverse de situations professionnelles. Ces définitions peuvent être très globales, comme celle de Barbier et Demailly (1994), pour lesquels le développement professionnel constitue l'ensemble des changements de compétences, qu'ils soient individuels ou collectifs, ou de composantes identitaires qui sont mobilisées ou susceptibles de l'être dans des situations et un contexte professionnel. Une autre définition assez englobante, celle de Kwakman (2003), a une base plus comportementale et parle de participations à des activités d'apprentissage « telles que la formation, la lecture, les activités de collaboration, l'expérimentation et la réflexion » (Kwakman, 2003, p. 153). En continuant d'investiguer le caractère polysémique du développement professionnel, il est possible de dénombrer de nombreux synonymes qui diffèrent dans les articles scientifiques : développement de carrière, évolution professionnelle (Huberman, 1989 ; Huberman, Grounauer, & Marti, 1989), croissance professionnelle (Glatthorn, 1995 ; Kagan, 1992), formation continue (Boucher et L'Hostie, 1997 ; Lafortune, Deaudelin, Doudin, & Martin, 2001), perfectionnement, développement pédagogique (Lafortune et al., 2001), etc.

Ces concepts sont apparus pour compléter le paradigme éducatif formel, parfois perçu comme trop strict et étroit, et obligeant les employés à se conformer à un même schéma d'apprentissage, quelques soient leurs niveaux et leurs besoins spécifiques. Cependant, Illitch (1971) montre que les apprentissages tirés de l'expérience sont nettement moins valorisés que les apprentissages survenus lors de situations d'apprentissage structurées et officielles. Le terme « informel », apparu dans cette décennie suppose une subordination hiérarchique vis-à-vis de l'apprentissage dit formel. Cela laisse supposer que les apprentissages informels, qui ont lieu généralement sans contrôle et parfois sans intention ou implicitement, sont moins importants. Cependant, l'éducation a de plus en plus pris la forme d'un processus continu et quotidien, tout au long de la carrière professionnelle et *a fortiori* de la vie. Ce processus regroupe les apprentissages formels et les apprentissages informels. Même si les recherches

traditionnelles montrent que les apprentissages et l'amélioration des performances prennent place selon des objectifs spécifiques dans des programmes formels structurés par des professionnels de la formation, d'autres recherches plus récentes montrent que la majorité des apprentissages sur le lieu de travail n'a pas lieu dans un cadre formel et planifié (Gerken, 2016). En effet, selon Gerken, le travail quotidien et les défis qu'il impose poussent au développement professionnel et à la mise à jour des compétences, en grande partie par les expériences de travail au quotidien et les interactions avec les collègues et les supérieurs. Le concept d'apprentissage informel s'est donc greffé au contexte du développement professionnel, en particulier sur la notion d'apprentissage sur le lieu de travail (workplace learning).

L'apprentissage informel, ou les apprentissages se situant sur le pôle informel du continuum, ont en termes d'apprentissage une place de première importance dans le monde du travail. Par exemple, Tough (2002), puis Schugurensky (2007) et Noe et ses collègues (2013) comparent les apprentissages lors de situations intentionnelles d'apprentissage à un iceberg, dont les apprentissages formels ne forment que la partie visible minoritaire, accompagnés d'une plus grande proportion d'apprentissages informels invisibles. La partie émergée, les apprentissages formels, ne représente que 20 (Marsick & Watkins, 2001) à 25% (Noe et al., 2013) des apprentissages réels réalisés au travail et dans notre quotidien. Un auteur, Sorohan (1993) pousse la proportion de l'apprentissage informel jusque 90%, en réduisant la partie formelle à 10% des apprentissages sur le lieu de travail. Schugurensky (2007) ajoute que la notion d'apprentissage informel permet de développer la quasi-totalité des apprentissages utiles dans l'exercice de sa profession et que cela s'applique dans l'ensemble des emplois et des lieux de travail. D'après Werquin (2010), cette raison pousse les décideurs de l'OCDE à prendre conscience de la richesse des compétences acquises par l'expérience et le social dans le capital humain. Malgré cette prédominance de l'informel sur le formel, la recherche ne s'est que peu intéressée à l'apprentissage informel sur le lieu de travail avant les années 2000 (Baumert et al., 2010).

Plus récemment et en ce qui concerne les enseignants, Uwamariya et Mukamurera (2005) menèrent une revue de littérature spécifique et en dégagèrent l'idée que le développement professionnel des enseignants est « un processus de changement, de transformation, par lequel les enseignants parviennent peu à peu à améliorer leur pratique, à maîtriser leur travail et à se sentir à l'aise dans leur pratique. […] Par ailleurs, il ne faut pas perdre de vue que le développement professionnel implique l'enseignant comme personne, avec sa rationalité et sa subjectivité » (p. 148). Ce changement de pratiques professionnelles d'enseignement est un des piliers principaux du développement professionnel, mais il n'est pas le seul et doit être complété par le processus d'évolution des conceptions et des identités professionnelles. Le développement professionnel d'un enseignant constituerait donc un processus de changement de pratiques d'enseignement, mais pas uniquement. Il concernerait aussi plus largement le changement de conceptions personnelles à propos de son métier ou de son rôle, donc l'évolution de son identité professionnelle. Dans le prolongement des premiers travaux sur le sujets, Huberman (1993) et d'autres auteurs (Day, 1999; Lynn, 2002 ; Richer et al., 2011 ; Sammons et al., 2007) se sont intéressés à l'apprentissage de l'enseignement et au

développement de l'expérience professionnelle tout au long de la carrière enseignante, par l'établissement de stades de carrière. Par la suite, d'autres auteurs (par ex. Jurasaite-Harbison & Rex, 2010) se sont affranchis des stades de carrière, relativement linéaires, pour mettre en avant l'importance du contexte organisationnel et de l'environnement sur le processus du développement professionnel des enseignants.

À l'intérieur de cet environnement scolaire se trouve entre autres les valeurs de coopération, du droit à l'erreur, de travail collaboratif et de partages de pratiques. À ce sujet la littérature scientifique met en avant les avantages du travail collaboratif et de l'échange de pratiques professionnelles, principalement de manière informelle au sein de l'établissement scolaire (par ex. Engeström, 1994 ; Hoekstra et al., 2009 ; Korthagen, 2010 ; Little, 2003 ; Mc Nally, Blake, & Reid, 2009 ; Rytivaara & Kershner, 2012 ; Vangrieken, Dochy, Raes, & Kyndt, 2015). Little (2003) a d'ailleurs présenté une liste non exhaustive des résultats de la collaboration des enseignants : l'acquisition et le développement de nouveaux savoirs, le développement de nouvelles conceptions de son identité d'enseignant et des représentations afférentes, l'apparition ou l'enrichissement de la culture de groupe à l'intérieur de l'école, le questionnement et le renouvellement de ses propres pratiques d'enseignement ou extérieures à la classe, le développement d'amitié entre collègues, une meilleure assurance dans son métier, un plus grand engagement dans les projets collaboratifs, etc. À cela, Donnay et Charlier (2006) ajoutent que le développement professionnel des enseignants est un processus continu, dont les responsabilités sont partagées à la fois par l'enseignant, duquel dépend son propre développement de compétence, mais aussi par l'environnement scolaire, qui doit être favorable et soutenant. Ce processus continu de développement professionnel est un concept à rattacher à l'apprentissage sur le lieu de travail.

Enfin, à la question de l'importance relative de l'apprentissage formel et de l'apprentissage informel, certains auteurs concluent que, malgré une prévalence de l'apprentissage informel, les deux types d'apprentissage sont tous les deux centraux et se complètent l'un l'autre (par ex. Livingstone, 2001 ; Soni, 2015). Selon Livingstone (2001), les apprentissages informels ont lieu en parallèle de l'apprentissage formel et ne les remplacent pas. Certaines organisations ont d'ailleurs mis en place des systèmes incitatifs pour, d'une part, soutenir les formations formelles et, d'autre part, encourager la culture d'entreprise de collaboration et d'apprentissage continu sur le lieu de travail, afin de s'assurer que leurs employés bénéficient du meilleur des deux types d'apprentissage (Soni, 2015 ; Veenstra, 2015). Pour Brougère et Bézille (2007), l'apprentissage formel et l'apprentissage informel sont en interaction permanente. Pour d'autres auteurs, ils s'imbriquent même l'un dans l'autre (par ex. Berry & Garcia, 2016).

2. Le rôle de l'apprentissage continu sur le lieu de travail

2.1 Politique actuelle

L'apprentissage continu sur le lieu de travail, appelé par la Fédération Wallonie-Bruxelles (FWB) « formation en cours de carrière » est statutairement à la fois un droit et un devoir pour chaque enseignant de Belgique francophone (FWB, Décret du 11 juillet 2002). Selon la FWB, la formation en cours de carrière se définit comme suit :

> Formation qui inclut tant les formations pouvant être suivies dans le cadre de la fonction occupée par l'enseignant (formation continuée) que dans le cadre de la préparation à l'exercice de la même fonction dans un autre type d'enseignement, d'une autre fonction pour laquelle il n'existe pas de formation initiale ou d'une fonction de promotion ou de sélection (p. 1, Article 2, Alinéa 7).

Le décret demande aussi que cette formation en cours de carrière comprenne six demi-jours par année scolaire et soit obligatoire pour tous les membres du personnel nommés à titre définitif. Elle est également imposée à tous les membres du personnel désigné temporairement s'ils sont engagés pour une année scolaire complète ou dans le cas où la formation s'inscrit dans ses horaires de cours. Le nombre de six demi-jours se décompose en deux demi-jours de formations organisées au niveau macro (en inter-réseaux) et les quatre autres demi-jours dans des formations organisées au niveau méso (en réseau ou au sein du même pouvoir organisateur) ou à celui micro (au sein de l'établissement).

S'ajoute à cette partie obligatoire la formation organisée par l'enseignant lui-même sur base volontaire. Cette formation peut se dérouler en dehors du temps de prestation de l'enseignant (cours, permanence, conseils de classe, etc.) sans limite du nombre de demi-jours par année scolaire, ou pendant les heures de prestation sans pouvoir excéder six demi-jours par année scolaire (dix demi-jours pour les enseignants du niveau fondamental). Pour être complet, il faut également ajouter qu'une dérogation peut être accordée, sur demande du directeur d'établissement ou du responsable du pouvoir organisateur adressée au Ministre faisant fonction.

En dehors de ce décret, il n'existe que peu de traces de formation continue plus informelle ou d'apprentissage informel des enseignants dans les textes de référence. Cependant, il existe une page internet appelée « favoriser la collaboration entre enseignants » sur enseignement.be, le site des services publics de Communauté française de Belgique (la Fédération Wallonie-Bruxelles). Cette page internet comporte une liste des réseaux et associations en ligne qui favorisent la collaboration (plus informelle) entre enseignants. Enfin, la circulaire 5388 du 28/08/2015, spécifiant l'accueil des nouveaux enseignants (primaires/secondaires) invite à mettre en place, parmi plusieurs mesures d'accueil, la désignation d'un référent pour conseiller et assister le nouveau collègue. Cette mesure vise à soutenir le recours à un collègue référent pour des questions ou des demandes de feedbacks

plus informels. En dehors de ces deux mesures, il n'existe pas de reconnaissance ou de soutien de l'apprentissage informel dans le milieu de l'enseignement, à une échelle globale.

Pourtant, selon Knight (2002), la formation initiale des enseignants ne peut pas apporter tous les savoirs nécessaires à l'exercice de la profession d'enseigner, en particulier les savoirs procéduraux. Ces savoirs procéduraux, qui portent sur la manière d'enseigner, ne peuvent pas aborder l'ensemble des situations professionnelles que le futur enseignant rencontrera tout au long de sa carrière (Brodeur et al., 2005). En ajoutant à cela l'évolution constante de la société et de la recherche en éducation, pédagogie et didactique ainsi que des adaptations à apporter aux savoirs enseignés et aux méthodes d'enseignement, la formation continue, formelle ou informelle, s'avère absolument nécessaire (par ex. Kwakman, 2001). Le manque de reconnaissance du pôle informel d'apprentissage en cours de carrière ne peut qu'être déploré, d'autant plus que cet apprentissage est entrepris par les enseignants de manière quotidienne.

2.2 Définition de l'apprentissage sur le lieu de travail

Selon Jacobs et Park (2009), l'apprentissage sur le lieu de travail se définit par « les nombreuses manières par lesquelles les employés d'une organisation apprennent au sein de celle-ci » (p. 134). De plus, parmi les nombreuses dimensions qui composent l'apprentissage sur le lieu de travail et qui seront le sujet de la partie 2.3. du présent chapitre, Jacobs et Park (2009) proposent aussi une décomposition du concept selon trois continuums, à savoir l'emplacement de l'apprentissage, le degré de planification et le rôle du formateur/facilitateur. Sur la base de leurs travaux, Kyndt et Beausaert (2017) proposent une décomposition de l'apprentissage sur le lieu de travail selon 5 dimensions, à savoir le lieu de l'apprentissage, la planification, le rôle du formateur/coach, le rôle des pairs et la proactivité de l'apprenant.

Premièrement, la question du lieu de l'apprentissage sépare, d'une part, les apprentissages ayant lieu hors du lieu géographique du travail et, d'autre part, ceux pour lesquels le lieu de travail est perçu comme stimulus même d'apprentissage (Clarke, 2005). Cette séparation des lieux de l'apprentissage est un point qui peut être flou dans les cas des enseignants, pour qui le travail s'étale dans plusieurs lieux, comme les salles de classe et la salle des professeurs, situés dans l'établissement scolaire, mais aussi à leurs domiciles privés et lors de réunions chez d'autres enseignants (par ex. Mawhinney, 2010). Cette perméabilité ou cette élasticité de l'apprentissage sur le lieu de travail a poussé des auteurs (par ex. Stern & Sommerlad, 1999) à proposer un élargissement du concept, dans lequel les apprentissages sur le milieu de travail peuvent également survenir par-delà les frontières physiques et géographiques du bâtiment dans lequel l'employé travaille quotidiennement. Par exemple lors de réunions à l'extérieur, de télétravail, d'évènements avec les collègues ou liés au travail ou encore de déplacements professionnels.

Deuxièmement, la question de la planification de l'apprentissage. En effet les activités d'apprentissage peuvent être décidées et planifiées mais il peut aussi, à l'autre bout du continuum, être non planifiées et mêmes implicites et non conscientes. Selon Eraut (2000,

2004), les apprentissages peuvent être délibératifs, réactifs ou implicites. Un apprentissage est dit délibératif lorsqu'il est créé spécifiquement dans un but d'apprentissage et peut être formel ou informel, réactif lorsqu'il est non planifié et principalement par des activités qui n'ont pas une intention principale d'apprentissage mais dont les savoirs sont explicités et, enfin, implicite lorsqu'il est non intentionnel et inconscient. Selon Kyndt, Dochy et Nijs (2009) l'absence d'intentionnalité, le manque de conscience et la spontanéité des apprentissages implicites les rendent difficiles à observer et *a fortiori* à mesurer.

Ensuite, les troisième et quatrième dimensions font référence aux rôles d'autres personnes dans l'apprentissage. La troisième dimension se focalise sur le rôle du formateur ou du coach en tant que facilitateur du processus d'apprentissage alors que la quatrième dimension se penche sur les rôles des pairs et des collègues. Ces dimensions se basent sur les travaux de nombreux auteurs qui distinguent les apprentissages ayant lieu en présence ou hors de la présence d'autres personnes (par ex. Clough, Jones, McAndrew, & Scanlon, 2008; Froehlich, Beausaert & Segers, 2015; Kwakman, 2003; Noe, Tews, & Marand, 2013). Par exemple, Noe, Tews et Marand (2013) ont travaillé sur les apprentissages informels et leurs origines, selon que les savoirs viennent de soi (par essai-erreur, par introspection, etc.), des autres (par échanges de pratiques, discussions, etc.) ou par des sources externes mais sans composante interpersonnelle (par vidéos en ligne, textes écrits par d'autres, etc.). D'après plusieurs auteurs (par ex. Christensen, 2013; Jeon & Kim, 2012; Marsick, 2009), les apprenants bénéficient majoritairement de l'apprentissage par interactions sociales, qui ont lieu avec leurs collègues, leurs superviseurs ou autres. Skule (2004) précise que les sources d'apprentissage social sont principalement les collègues et les experts du domaine. Enfin, Froehlich et ses collègues (2015) ont élaboré les activités d'apprentissage qui composent les activités informelles sociales d'apprentissage, à savoir la recherche de feedback, d'aide et d'informations.

Finalement, la cinquième dimension porte sur la proactivité de la personne en situation d'apprentissage. Les apprenants peuvent être initiateurs actifs des activités qu'ils entreprennent à finalité d'apprentissage. Les enseignants peuvent, par exemple, demander des conseils à leurs collègues, aller faire des recherches sur internet ou apprendre par essais-erreurs volontairement et de manière proactive pour continuer à se former quotidiennement. Selon Rytivaara et Kershner (2012), la volonté des enseignants à apprendre et à se former est une condition pour que cet apprentissage survienne.

En résumé, l'apprentissage sur le lieu de travail est un concept complexe qui possède de nombreuses dimensions. Il peut premièrement venir d'activités formelles ou informelles d'apprentissage (Eraut, 2000). Informellement, les dimensions dépendent de la source de l'apprentissage - d'eux-mêmes, des autres et de sources non-interpersonnelles (Noe, Tews, & Marand, 2013) - ou selon le stimulus - apprentissages délibératif, réactif ou implicite (Eraut, 2000, 2001). Enfin, les apprentissages informels peuvent être définis selon cinq dimensions : (1) le lieu de l'apprentissage, (2) la planification, (3) le rôle du formateur/coach, (4) le rôle des pairs et (5) la proactivité de l'apprenant (Jacobs & Park, 2009; Kyndt & Beausaert, 2017). Les différentes dimensions et les types s'activités d'apprentissage sur le lieu de travail seront investigués dans la partie suivante.

2.3 De l'apprentissage sur le lieu de travail à l'apprentissage informel

Comme mentionné précédemment, le concept d'apprentissage sur le lieu de travail ou « workplace learning » est utilisé dans le cadre de l'apprentissage continu des enseignants durant toute leur carrière, par l'intermédiaire de programmes de formation, de journées pédagogiques, de cours et conférences, mais aussi par l'intermédiaire d'apprentissages expérientiels sur le terrain ou sociaux, parfois généralement plus informels. D'après Tynjälä (2008) et Poell (2013), l'efficacité de l'apprentissage sur le lieu de travail dépend en grande partie des processus d'apprentissage desquels il s'approche, à savoir les types « formels » et « informels » d'apprentissage. Cette différenciation renvoie à l'idée que de nombreux apprentissages, dans la vie professionnelle, n'ont pas lieu dans le cadre des formations formelles proposées par l'organisation mais ont lieu de manière opportuniste et impromptue, parfois non-intentionnellement (Eraut, 2004). Les notions d'apprentissage formel ou informel apparaissent dans les années 70 (Coombs, Prosser, & Ahmed, 1973) et définissent le processus continu d'apprentissage basé sur l'expérience tout au long d'une carrière en tant qu'apprentissage informel. Ce dernier type peut être aussi désigné dans certains cas par le terme « non formel » (Eraut, 2000, 2001). La distinction entre les types d'apprentissage « informel » et « non-formel » sera développée plus loin.

L'apprentissage formel est principalement défini comme étant une modalité d'apprentissage structurée, assez proche du paradigme standard de l'éducation scolaire (Marsick & Watkins, 1990, 2001). La notion de « paradigme standard » de l'apprentissage fait référence à la présence d'un cadre pédagogique traditionnaliste comprenant une interaction didactique et la présence d'un enseignant ou d'un formateur (Beckett & Hager, 2002 ; Hager, 2004). Dans le contexte du travail, cet apprentissage formel se compose donc d'activités planifiées et approuvées par la hiérarchie en vue d'accompagner l'apprentissage des employés et la mise en valeur de compétences spécifiques et leurs utilisations en contexte de travail. Pour être exhaustif, Eraut (2000) précise l'ensemble des caractéristiques qui compose l'apprentissage formel, à savoir ; l'existence d'un enseignant ou d'un formateur, celle d'une qualification des acquis d'apprentissage et la spécification externe des résultats.

L'apprentissage informel, lui, peut être défini de manière globale en l'opposant à l'apprentissage formel, c'est-à-dire en le présentant comme tout apprentissage qui n'est pas formel (par ex. Colley et al., 2002), mais cette définition restreinte donne une vision limitative de l'apprentissage informel. D'après Callanan, Cervantes et Loomis (2011), les définitions de l'apprentissage informel dépendent du prisme par lequel les chercheurs voient le concept, le mesurent et l'utilisent. De ce fait, la littérature propose une grande variété de définitions de l'apprentissage informel, parfois assez proches et interchangeables, d'autres fois portant sur des concepts assez différents (Clarke, 2005 ; Cranton, Táíwò, & Mejiuni, 2015). Le paragraphe suivant présente un panel des différentes visions et définitions de l'apprentissage informel.

L'apprentissage informel peut se définir tout simplement en fonction de la présence ou de l'absence d'une organisation formelle ou non de l'activité d'apprentissage par la hiérarchie

de l'organisation (Dale & Bell, 1999). Dans ce cadre, l'activité informelle d'apprentissage a lieu sur le lieu et dans le contexte du travail et peut être ou non encouragée spécifiquement. Marsick et Watkins (1990, 2001) proposent, eux, une définition plus large et avancent que l'apprentissage informel se présente à chaque endroit où les personnes désirent apprendre et en ont l'occasion. Selon ces auteurs, l'apprentissage informel est donc uniquement intentionnel mais pas toujours structuré. À l'inverse, d'autres auteurs avancent, eux, que l'apprentissage informel a le plus souvent lieu inconsciemment et de manière spontanée (par ex. Tjepkema, 2002). Pour Eraut (2000), l'apprentissage informel peut être intentionnel ou non, mais dépend principalement de l'organisation du moment d'apprentissage et la présence d'un professeur. Eraut (2000, 2001) différencie également l'apprentissage formel de l'apprentissage non-formel. Concernant ce type d'apprentissage, qui met l'accent sur les processus d'apprentissage intentionnels ou non intentionnels, Marsick et ses collaborateurs parleront ensuite (2009) d'une forme d'apprentissage distincte à séparer de l'apprentissage informel et qui dépend des connaissances tacites des travailleurs. Le concept d'apprentissage non-formel sera développé dans le prochain paragraphe. Pour en revenir aux différentes définitions de l'apprentissage informel, Livingstone (2001) le définit comme étant tout moment ou toute activité qui implique « la recherche de connaissances ou d'habiletés qui se produisent sans la présence de critères scolaires extérieurement imposés » (p. 4), c'est-à-dire hors de toutes structures organisées par l'établissement ou les institutions éducatives. La même année, la Commission Européenne (2001) publie elle aussi une définition de l'apprentissage informel qui, comme pour celle de Livingstone (2001), ne se base pas sur l'opposition vis-à-vis de l'apprentissage formel. L'apprentissage informel est défini comme étant un apprentissage « découlant des activités quotidiennes liées au travail, à la famille ou aux loisirs. Il n'est pas structuré (en termes d'objectifs d'apprentissage, de temps d'apprentissage ou de soutien à l'apprentissage) et ne conduit généralement pas à la certification. L'apprentissage informel peut être intentionnel, mais, dans la plupart des cas, il ne l'est pas » (p. 32). Quelques années plus tard, dans la foulée, Schugurensky (2007) revient à une définition comparative et mais parlera d'expérience d'apprentissage, principalement permises par les interactions avec les autres et qui sont considérée comme informelles lorsqu'elles sortent des limites du formel et du non-formel, dispensé par des organisations éducatives produisant des programmes. Il rejoint donc Eraut (2000) sur l'établissement d'une catégorie résiduelle, plus large et plus floue, basée sur l'expérience de vie et de travail. Trois ans plus tard, Richter, Kunter, Klusmann, Lüdtke et Baumert (2011) trouvent un compromis et parlent, dans le contexte des carrières enseignantes, « d'opportunités informelles d'apprentissage ». Ces dernières ne sont pas définies selon l'apprentissage formel, mais les auteurs précisent qu'elles sont libres dans les environnements (professionnel, para-professionnel, personnel) et ne suivent pas de programme spécifique. Ces opportunités informelles d'apprentissage se basent sur les activités suivies et non sur le contenu de l'apprentissage. Elles comprennent les activités collaboratives, comme les interactions avec les parents d'élèves ou les collègues, et les activités individuelles, comme les lectures de la littérature professionnelle. Ces opportunités ne sont donc pas obligatoires, puisqu'extérieures à tout programme, mais dépend de la volonté et de l'initiative des apprenants. Cette idée d'apprentissage initié par l'apprenant pour son propre développement est reprise par Noe,

Tews et Marand (2013), qui se basent également sur les travaux de Marsick, Volpe et Watkins (1999). Pour Noe et ses collaborateurs (2013), l'apprentissage informel prend place lorsque l'employé se met en action ou en réflexion en dehors du cadre formel de son organisation, pour lui offrir des opportunités dans sa pratique. Ils rajoutent que le développement professionnel de l'employé, par apprentissage informel et selon son rythme, et est bénéfique à la fois pour l'employé et pour l'organisation, puisqu'il lui permet de mettre à jour les connaissances et les compétences nécessaires pour suivre l'évolution des situations professionnelles, en continuant à offrir des services de qualité. Noe et ses collègues (2013) proposent aussi une division des activités informelles d'apprentissage selon les sources du savoir. Cette division se fait selon trois dimensions, à savoir premièrement les apprentissages issus d'eux-mêmes (essais-erreur, introspection, etc.), deuxièmement les apprentissages issus de sources non-interpersonnelles, et troisièmement les savoirs issus d'autres personnes mais sans aucune composante sociale dans l'acquisition du savoir (lecture de littérature scientifique, pages internet, etc.) ou venant des autres (discussions, demandes, etc.), c'est-à-dire l'apprentissage social. Pour aller plus loin sur cette voie, le concept d'apprentissage informel social est lui-même divisé en trois activités (Froehlich et al., 2015) : la recherche de feedback, la recherche d'aide et la recherche d'informations. Premièrement, l'apprentissage social par feedback permet une rétroaction, un retour évaluatif sur un comportement professionnel qui va permettre de le transformer lors de la survenue future d'un évènement similaire. Deuxièmement, l'apprentissage social par demande d'aide permet de surmonter un problème en recherchant socialement la solution chez d'autres personnes. Troisièmement, l'apprentissage social par demande d'informations permet une acquisition de savoirs issus d'autres personnes et un partage d'idées.

Ensuite, en 2015, Marsick et Watkins ont peaufiné leur définition et proposent de différencier l'apprentissage informel et l'apprentissage formel en fonction non seulement du degré de contrôle dont l'apprenant dispose mais aussi de l'emplacement de l'activité d'apprentissage et de la planification des résultats attendus. Il peut s'agir par exemple de coaching, de réseau professionnel, d'apprentissage par essai-erreur ou encore de mentorat. L'apprentissage informel est toujours perçu comme extérieur au cadre formel, mais selon cette définition, il peut être soutenu par l'organisation et se structurer. Enfin, plus récemment, Gerken (2016) définit d'apprentissage informel selon la spontanéité de l'activité d'apprentissage. Cette activité d'apprentissage se déclare à l'initiative de l'employé, qui la met en place selon son rythme d'apprentissage et ses préférences personnelles. Le terme d'apprentissage « informel » et ses définitions ont été grandement discutés dans la littérature et devront donc, dans la présente thèse, être plus clairement établis pour permettre de les utiliser.

Depuis sa création par Eraut (2000,2001), le terme « non-formel » est parfois utilisé comme synonyme d'« informel » pour caractériser/désigner un apprentissage spécifique, qui s'oppose à celui formel, des enseignants. Les discussions de ses articles sur l'apprentissage non-formel (2000, 2001) mettent l'emphase sur le moment où les stimuli, les facilitateurs d'apprentissage et les interactions sont générés et le temps qui se passe entre eux. Il met en relation ce temps passé entre les évènements déclencheurs et le moment de l'apprentissage

avec l'acquisition des connaissances mesurée explicitement. Le développement du terme « apprentissage non-formel » par Eraut dans ces articles peut être compris, selon Manuti, Pastore, Scardigno, Giancaspro et Morciano (2015) dans une démarche de différentiation vis-à-vis de l'apprentissage informel, qu'il juge comme omniprésent et trop difficile à décrire. Cependant, Eraut fit marche arrière par la suite, dans son article de 2004, et applique sa typologie des apprentissages non-formels directement aux apprentissages informels sans réellement justifier ce qui motive ce changement. Par la suite, Schugurensky (2007) utilise l'appellation « éducation non-formelle » pour invoquer les activités d'apprentissage ayant lieu hors du circuit scolaire standard et officiel, dans des programmes d'apprentissage dans lesquels l'apprenant se porte volontaire et souvent assez court. Dans cette définition du non-formel, la différence avec le formel est à trouver dans l'absence de prérequis pour accéder à l'activité de formation. Par contre, pour Schugurensky, les deux termes partagent l'obligation de la présence d'un professeur ou d'un formateur. Étant donné que le terme de non-formel est utilisé par au moins deux auteurs pour se référer à deux réalités différentes (une réalité complétement opposée au concept d'apprentissage formel et une assez proche de celui-ci) et qu'un de ces auteurs a abandonné le terme par la suite, le terme d'apprentissage informel, plus utilisé dans la littérature, lui sera préféré dans cette thèse. En conséquence, bien qu'il fut nécessaire d'aborder ce terme dans une volonté d'exhaustivité, le terme « non-formel » ne sera plus utilisé après ce paragraphe.

De la revue de littérature sur la notion d'apprentissage informel, il apparaît que ce dernier est constamment mis en opposition avec l'apprentissage formel, ces deux apprentissages sont donc considérés comme deux concepts dichotomiques. Cependant, la question de savoir si une situation d'apprentissage rentre nécessairement dans une de ces deux catégories se pose, et avec elle la possibilité de situer une expérience d'apprentissage à cheval sur la frontière imaginaire dessinée entre les deux construits. En réponse à cette question, Kyndt, Gijbels, Grosemans et Donche (2016) considèrent que les deux types d'apprentissage ne sont pas des construits dichotomiques. Dans cette optique, Eraut (2004) indique que toute situation d'apprentissage combine les deux types d'apprentissage dans une certaine mesure et à des degrés divers. L'apprentissages formels et les apprentissages informels ne seraient donc pas des concepts bien définis, clairs et contraires, mais des caractéristiques aux deux extrêmes du continuum de formalité/informalité des situations d'apprentissages (Colley et al., 2003 ; Kyndt et al., 2016 ; Sawchuk, 2008). Pour sortir du carcan dichotomique, Eraut (2004) précise que les apprentissages informels sont les apprentissages qui se situent plus près de l'extrémité informelle que de l'extrémité formelle du continuum. Il lie l'extrémité informelle du continuum avec les traits d'opportunisme, de non-intentionnalité, de manque de structure et d'absence de professeur de l'apprentissage.

2.4 L'apprentissage informel des enseignants de primaire et de secondaire

L'objectif de tous les établissements scolaires, *a minori* des écoles primaires et secondaires, est de former l'ensemble de ses élèves de la meilleure manière possible et d'assurer une éducation optimale, via l'ensemble de leurs personnels éducatifs et leurs projets

pédagogiques. La problématique de l'apprentissage continu, formel et informel, a d'autant d'importance que les enseignants doivent continuellement se mettre à jour de l'évolution de la société, des sciences et des innovations pédagogiques (Kyndt et al., 2016).

De ce fait, l'importance et la reconnaissance de l'apprentissage informel des enseignants en tant que processus nécessaire à l'exercice de leur profession et à leur développement professionnel grandissent continuellement (Jacobs & Park, 2009). En se penchant sur le sujet, Hoekstra et ses collègues (2009) relient l'intérêt croissant porté à l'apprentissage informel des enseignants au bousculement qu'il apporte aux paradigmes classiques du développement professionnel, mais aussi plus largement aux paradigmes de l'apprentissage. Or, ces paradigmes classiques (cognitivistes et constructivistes), aussi utilisés dans les établissements scolaires, considèrent que l'apprentissage se fait par l'intermédiaire d'activités intentionnelles, orienté vers un but d'acquisitions de savoirs. Plusieurs auteurs ont pu, depuis de nombreuses années, mettre en évidence que les enseignants, pourtant partisans de l'apprentissage formels pour leurs élèves, développent principalement leurs compétences professionnelles propres de manière informelles (par ex. Charlier, 1998 ; Day, 1999).

À partir du phénomène d'apprentissage informel des enseignants, la littérature scientifique s'est penchée sur d'autres variables qui évoluent dans le sens de cet apprentissage ou en opposition avec celui-ci. Ces variables vont du développement professionnel au sens large (par ex. Hoekstra et al., 2009) ou encore le développement des compétences professionnelles, définies comme les connaissances, aptitudes et attitudes (par ex. Matthews, 1999 ; Van Eekelen, Vermunt, & Boshuizen, 2006) jusqu'à des variables plus précises comme les comportements d'innovation au travail des enseignants (Messman & Mulder, 2011).

2.4.1 Les déterminants de l'apprentissage informel des enseignants

Une revue de la littérature des antécédents et conséquences de l'apprentissage informel des enseignants a été menée en 2016 par Kyndt et ses collègues pour permettre une vue plus précise des relations qu'entretient ce concept. D'après ces auteurs, les activités informelles d'apprentissage des enseignants possèdent des facteurs facilitateurs ou inhibiteurs classés selon les trois niveaux de Baert, De Rick et Van Valckenborg (2006) : niveau individuel, niveau professionnel et niveau du contexte scolaire et général. Au niveau individuel, les principaux facteurs liés au suivi d'activités informelles d'apprentissage par les enseignants sont leur volonté d'apprendre et d'améliorer leur pratique (par ex. Cameron, Mulholland, & Branson, 2013 ; Collinson & Cook, 2004 ; Van Eekelen, Vermunt, & Boshuizen, 2006), tout comme leur motivation à acquérir des savoirs et des compétences utiles dans leur métier (par ex. Armour & Yelling, 2007 ; Cameron et al., 2013 ; Jacot, Raemdonck, & Frenay, 2015 ; Scribner, 1999). De plus, la personnalité des enseignants, en particulier la proactivité et l'extraversion, influence aussi leur apprentissages informels (par ex. Jurasaite-Harbison, 2008 ; Lohman, 2005 ; Raemdonck, Gijbels, & Van Groen, 2014). Au niveau professionnel, deux pôles ont été étudié par Clément et Vandenberghe (2000, 2001), à savoir l'autonomie accordée aux enseignants et le travail d'équipe. L'autonomie est liée à l'expérimentation dans

la classe (Hoekstra et al., 2009) et le travail en équipe est lié au partage de pratique et à l'observation (Collinson & Cook, 2004 ; Jurasaite-Harbison, 2009), toutes trois des activités informelles d'apprentissage. Enfin, le niveau du contexte scolaire et général reprend les liens de l'apprentissage informel avec des variables comme la culture scolaire de collaboration (par ex. Cameron et al., 2013; Jurasaite-Harbison & Rex, 2010 ; McCormack et al., 2006) et de récompenses (Lohman, 2000, 2005, 2006 ; Wilson & Demetriou, 2007), ou encore les normes et valeurs en place dans l'école (par ex. Christensen, 2013). Cette question de l'importance du climat scolaire d'apprentissage sur l'apprentissage informel des enseignants, et en particulier sa dimension sociale, sera l'objet du paragraphe suivant.

S'ajoute aux déterminants de l'apprentissage informel des enseignants le climat scolaire d'apprentissage et ses dimensions. En effet, Marsick et Volpe (1999) puis plusieurs autres auteurs (par ex. Clement & Vandenberghe, 2000 ; Flores, 2004 ; Jurasaite-Harbison & Rex, 2010 ; Krečič & Grmek, 2008 ; Williams, Prestage, & Bedward, 2001) avancent qu'un climat d'apprentissage soutenant favorise l'apprentissage informel social des enseignants, via l'entraide, la collaboration et les échanges de feedbacks et d'idées. Par exemple, Clement et Vandenberghe (2000) ont rapporté les résultats d'une étude qualitative longitudinale. Ces auteurs ont associé 39 entretiens semi-structurés d'enseignants avec 2 études de cas complètes et 10 études de cas condensées. Ils en ont conclu qu'une relation positive pourrait exister entre un climat d'apprentissage positif et l'apprentissage informel des enseignants. Cette relation putative serait due à davantage de possibilités de demande d'aide envers ses collègues, à une plus grande collaboration et à de plus nombreux échanges d'expérience et d'idées. L'année suivante, Williams, Prestage et Bedward (2001) ont déduit de 46 entretiens avec des enseignants qu'une culture scolaire basée sur la coopération favorise également les échanges informels et spontanés entre enseignants. Deux ans plus tard, Johnson (2003) a conclu sur la base d'une étude associant 115 questionnaires et 24 entretiens que les enseignants rapportent avoir davantage d'opportunités d'activités d'apprentissages lorsque le climat scolaire est porté sur la coopération entre enseignants. Krečič et Grmek (2008) ont analysé 542 questionnaires d'enseignants slovènes et ont constaté que la politique scolaire peut encourager les enseignants à collaborer et contribue à soutenir le développement professionnel des enseignants. Enfin, ces résultats sont encore renforcés par Jurasaite-Harbison et Rex (2010) et par Lee et ses collaborateurs (2008), qui ont eux aussi constaté que les enseignants gagnent des opportunités d'apprentissage informel lorsque la culture scolaire et le climat scolaire sont soutenants. Dans leurs discussions, ces auteurs émettent l'hypothèse que le climat d'apprentissage scolaire joue un rôle essentiel dans les activités sociales informelles d'apprentissage. Pour arriver à cette hypothèse, Jurasaite-Harbison et Rex (2010) ont effectué une étude de cas cross-culturelle entre la Lituanie et les États-Unis et ont constaté que les habitudes et traditions scolaires jouent un rôle dans la création d'un environnement favorable aux apprentissages informels.

Afin de confirmer et d'étudier les effets du climat scolaire d'apprentissage sur les apprentissages informels sociaux des enseignants, cette thèse se raccroche à un cadre théorique divisant le climat d'apprentissage en trois dimensions, pour une analyse plus fine des processus en œuvre. Dans la littérature scientifique, le climat d'apprentissage scolaire

fait référence aux politiques, procédures et normes présentes dans l'école et qui contribuent à créer un environnement encourageant les activités d'apprentissage que les enseignants entreprennent pour accroître leurs capacités et compétences (Marsick, Watkins, Callahan, & Volpe, 2009 ; Mikkelsen & Grønhaug, 1999 ; Nikolova et al, 2014 ; Schneider, Brief, & Guzzo, 1996 ; Schneider, Ehrhart, & Macey, 2013). Comme mentionné plus haut, le climat d'apprentissage peut se diviser en trois dimensions : facilitation des apprentissages, appréciation des apprentissages et évitement des erreurs (Nikolova et al., 2014). Appliquée au cadre scolaire, la première dimension, c'est-à-dire la facilitation des apprentissages, représente la perception qu'ont les enseignants des politiques et des pratiques que l'école met en place pour donner accès aux ressources d'apprentissage. La dimension d'appréciation fait référence à la perception qu'ont les enseignants des incitations que l'école met en place pour récompenser leurs activités d'apprentissages. Ces incitations peuvent être matérielles ou immatérielles. Enfin, la dimension d'évitement des erreurs fait référence au manque de sécurité psychologique des enseignants en lien avec la tolérance qu'ils perçoivent envers leurs erreurs (Van Dyck, Frese, Baer, & Sonnentag, 2005). Les auteurs ont montré qu'un climat d'apprentissage en milieu de travail qui comprend la peur de commettre des erreurs peut rendre les employés anxieux au sujet de leur travail (Lee, Edmondson, Thomke, & Worline, 2004) et réticents à apprendre (Edmonson, 1999). Les comportements proactifs d'apprentissage peuvent être bloqués par le sentiment de devoir éviter de faire des erreurs (Lee et al., 2004).

2.4.2 Les effets de l'apprentissage informel des enseignants

En ce qui concerne les conséquences de l'apprentissage informel des enseignants, les études rapportées par Kyndt et ses collègues (2016) mettent en avant, entre autres, une meilleure connaissance de la branche enseignée (par ex. Flores, 2005 ; Fraser, 2010 ; Henze et al., 2009 ; Van Eekelen et al., 2006), un développement des capacités et des connaissances pédagogiques (par ex. Flores, 2005 ; Henze et al., 2009 ; Hoekstra et al., 2009; Kang & Cheng, 2014 ; Meirink et al., 2007), l'identité et les attitudes professionnelles (par ex. Burns, Schaefer, & Hayden, 2005 ; Hoekstra & Korthagen, 2011 ; Hodkinson & Hodkinson, 2005 ; McCormack et al., 2006 ; McNally et al., 2009 ; Van Eekelen et al., 2006). Pour donner quelques exemples, Fraser (2010) a mené une étude longitudinale auprès de deux enseignants expérimentés du primaire en multipliant les mesures et a constaté que les activités d'apprentissage informel permettent de combler les lacunes de la formation initiale des enseignants. Burns et ses collègues (2005) ont interrogé 48 enseignants à plusieurs moments et ont mis en avant que les enseignants développent des comportements informels au travail pour améliorer leurs pratiques, principalement par expérimentation, essais-erreurs et discussion avec leurs collègues. Hoeskstra et ses collègues (2009) montrent que les enseignants du secondaire utilisent des activités informelles d'apprentissage pour, notamment, développer de nouvelles méthodes d'enseignement, plus sûres ou plus innovantes. De même, Matthews (1999) a montré que l'apprentissage informel sur le lieu de travail, et non les formations formelles imposées par l'établissement, est souvent perçu par les enseignants comme le meilleur moyen d'acquérir de nouvelles compétences. Dans le but de mesurer l'impact des apprentissages informels sur les compétences et l'innovation des

enseignants, cette thèse propose un cadre théorique mesurant les compétences d'employabilité (Van der Heijde & Van der Heijden 2006) et les comportements d'innovation au travail (Scott & Bruce, 1994) appliquées au métier d'enseignant.

Dans ce cadre théorique, l'employabilité est conceptualisée en fonction de cinq compétences (Van der Heijde & Van der Heijden 2006), à savoir l'expertise professionnelle, l'anticipation/optimisation, la flexibilité personnelle, le sens de l'entreprise et l'équilibre entre sa vie privée et sa vie professionnelle. La première compétence est l'expertise professionnelle, qui se rapporte aux techniques et connaissances spécifiques à un domaine professionnel particulier, nécessaires pour résoudre les problèmes plus efficacement. La deuxième compétence est l'anticipation/optimisation et se rapporte à une composante active d'adaptation aux futurs changements dans son travail. La flexibilité personnelle est une compétence plus passive que l'anticipation/optimisation et fait référence à la capacité à assurer des transitions en douceur entre les différents rôles et postes ainsi que l'adaptation aux changements concrets imposés. La quatrième compétence d'employabilité est appelée l'esprit d'équipe ou le sens de l'entreprise. Cette compétence fait référence aux partages des responsabilités et des décisions au sein de l'entreprise. Enfin, la cinquième compétence d'employabilité, l'équilibre entre les vies privée et professionnelle, est la capacité à faire des compromis entre les intérêts et priorités parfois contradictoires de ces deux vies.

Van der Heijden et ses collaborateurs (2009) ont constaté par des analyses de régressions, une relation positive entre les apprentissages (formels et informels) et les compétences d'employabilité. Dans cette étude, l'apprentissage informel a été mesuré en termes de réseau au sein de l'université. Les résultats montrent un pouvoir prédicteur de cette mise en réseau sur quatre des compétences précitées, à savoir l'expertise, la flexibilité, l'esprit d'équipe et l'équilibre. De plus, le fait de posséder et de développer un vaste réseau à l'extérieur de l'université est lié positivement à l'anticipation/optimisation. Par ailleurs, Froehlich et ses collaborateurs ont montré en 2014 par des analyses d'équations structurelles que des relations significatives positives existaient entre les activités sociales informelles d'apprentissage (recherche de feedback, d'aide et d'informations) et les compétences d'employabilité de travailleurs néerlandais et autrichiens. De manière générale, plusieurs études soulignent que l'apprentissage informel est un outil efficace pour le développement professionnel (Eraut 2004 ; Lohman 2005 ; Schulz & Roßnagel 2010).

L'innovation au travail est quant à elle définie par la création et l'introduction volontaire de nouvelles façons plus utiles de faire son travail (West & Farr, 1990). Quel que soit l'emploi, les comportements d'innovation sont, selon Fuller et ses collègues (2006), cruciaux pour viser une amélioration permanente du travail. Scott et Bruce (1994), puis Janssen (2000, 2003) ont conceptualisé les comportements d'innovation au travail par un ensemble de trois tâches successives nécessaires pour les changements: la génération, la promotion et la réalisation des idées. La génération d'idées est la production d'une nouvelle idée utile pour l'organisation (Amabile et al. 1996). C'est aussi une nouvelle solution à un problème récent ou récurrent (Scott & Bruce 1994). La promotion des idées fait référence à l'échange de ces idées ou de ces solutions avec les autres (Scott & Bruce 1994). Enfin, la réalisation de l'idée est le moment où ces idées sont concrètement mises en œuvre dans l'organisation. Suivant ce

schéma, une idée est émise, puis partagée avec les collaborateurs potentiels et enfin mise en pratique, même si les différentes phases peuvent exister simultanément, pour des idées différentes. Appliqués aux enseignants, les comportements d'innovation au travail peuvent être, pour Messmann et Mulder (2011), l'observation et l'écoute des idées, leurs adaptations, l'élaboration et l'évaluation de stratégies nouvelles, la recherche de soutien auprès de ses collègues ou supérieurs, etc. Les comportements d'innovation des enseignants s'inscrit dans un domaine professionnel dynamique en constante évolution (Révai & Guerriero, 2017). Les nouvelles demandes et exigences des décideurs politiques (ou parfois des élèves) peuvent obliger les enseignants à innover et à mettre en place de nouvelles idées et pratiques. Certains auteurs soutiennent que la profession enseignante n'a pas suivi le rythme de l'évolution du domaine éducatif, y compris pour les nouvelles recherches en pédagogie (par ex. Dumont et coll., 2010).

La littérature scientifique met en avant l'importance de l'apprentissage en tant qu'antécédent des comportements d'innovation au travail (par ex. Keskin, 2006 ; Messmann & Mulder 2012). Ce lien peut s'expliquer par la nécessité d'acquérir de nouvelles connaissances sur lesquelles se baser pour pouvoir créer et mettre en œuvre de nouvelles idées (Calantone et al. 2002 ; Janssen & Van Yperen 2004). En effet, selon Hirst et ses collègues (2009), les connaissances disponibles influence positivement l'innovation. Plus concrètement, en ce qui concerne l'apprentissage social informel, la recherche a montré que la recherche de feedback favorise les comportements d'innovation au travail, en augmentant la génération et la mise en œuvre des idées (Noefer et al. 2009). Et en particulier dans le secteur de l'éducation, trois études précisent que l'apprentissage social informel et la collaboration aident les enseignants à développer et à mettre en œuvre des innovations (Messmann & Mulder 2011 ; Mohammad & Harlech-Jones 2008 ; Schussler et al. 2007). Enfin, Gerken (2016) a constaté l'existence de relations positives et significatives entre, d'une part, la recherche de feedback et d'information et, d'autre part, les trois dimensions des comportements d'innovation au travail. La troisième dimension de l'apprentissage informel selon le cadre de Froehlich et ses collaborateurs (2015) que Gerken a utilisé n'a pas pu être testée en raison d'une mauvaise cohérence interne de l'échelle. En conclusion, l'apprentissage est essentiel pour que les enseignants adoptent un comportement professionnel novateur, en particulier l'apprentissage social informel.

3. Objectifs et questions de recherche

À l'aune de la problématique du développement professionnel des enseignants, il semble que l'apprentissage informel des enseignants est fondamental dans la dynamique de l'apprentissage sur le lieu de travail. L'étude de ce sujet de recherche apparait comme un élément essentiel pour assurer un soutien du développement professionnel des enseignants. Bien sûr, étant donné la multitude des définitions de l'apprentissage informel des enseignants, une revue de littérature et une précision des concepts utilisés restent à être menées pour clarifier le cadre de la présente thèse. De plus, pour vérifier l'importance de l'apprentissage informel des enseignants dans le contexte de la Fédération Wallonie-Bruxelles, une étude devra également porter sur les liens que cet apprentissage entretient avec

les compétences des enseignants. Enfin, dans le but de dégager des pistes pour les soutenir, le rôle du contexte pour cet apprentissage informel devra également être étudié.

L'objectif général de la présente thèse est donc de décrire et documenter la manière dont les enseignants apprennent informellement, en tant qu'élément central de leur développement professionnel, et d'en explorer les relations possibles à la fois vers leurs effets en termes de compétences professionnelles et ses antécédents en termes de climat d'apprentissage à l'école. Si ces relations supposées s'avèrent exactes, des pistes concrètes à appliquer sur le terrain pour soutenir le développement et l'apprentissage des enseignants pourraient en être dégagées et proposées en conclusion de cette thèse de doctorat.

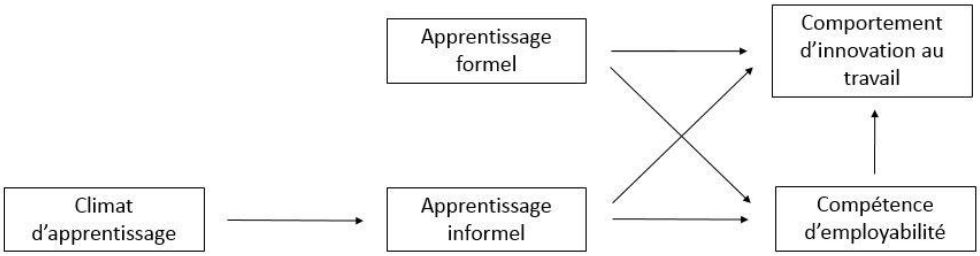

Figure 1. Modèle de Recherche Global

De cette problématique triple émerge naturellement trois objectifs de recherche, sur lesquelles ce projet de recherche va se pencher pour en dégager des questions de recherche plus précises et les hypothèses qui en découlent.

Objectif 1 –Décrire l'apprentissage informel des enseignants

Cet objectif consiste à investiguer à la fois la littérature scientifique existante sur le sujet de recherche et ses opérationnalisations concrètes, mais aussi la perception que possèdent les enseignants à l'égard de leurs activités informelles d'apprentissage dans le cadre professionnel.

Objectif 2 – Mesurer les effets de l'apprentissage informel des enseignants sur leurs compétences professionnelles

L'objectif 2 consiste à étudier les relations existantes entre l'apprentissage informel des enseignants, en particulier sa dimension sociale, et leurs compétences professionnelles, mesurées via les compétences d'employabilité et les comportements d'innovation au travail.

Objectif 3 – Mesurer le rôle du contexte pour l'apprentissage informel des enseignants

L'objectif 3 consiste à étudier les relations existantes entre l'apprentissage informel des enseignants, en particulier sa dimension sociale, et le contexte scolaire dans lesquels les

enseignants travaillent, mesuré via le cadre conceptuel du climat d'apprentissage sur le lieu de travail.

Sur la base de ces trois objectifs principaux, plusieurs questions de recherche ont été formulées et opérationnalisées par des études à réaliser. Ces études formeront le noyau de la présente thèse et permettront la formulation d'une conclusion générale.

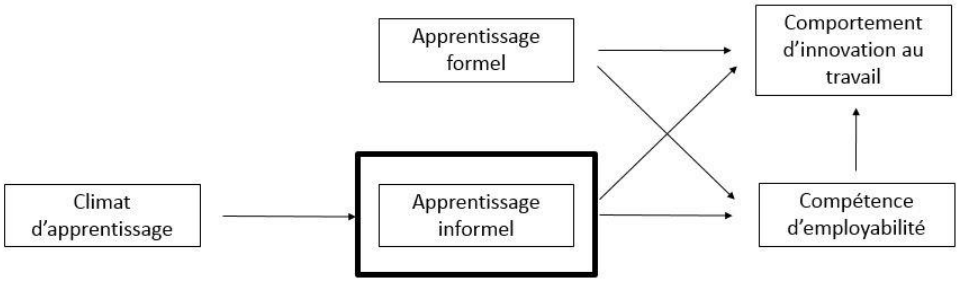

Figure 2. Point d'Attention du Premier Objectif

Questions de recherche liées à l'objectif 1

(1) Quelle définition générale de l'apprentissage informel des enseignants peut être élaborée sur la base de la littérature scientifique actuelle ?
(2) Quelles mesures du concept d'apprentissage informel des enseignants ont été développées par le passé ?
(3) Quelles sont les activités informelles d'apprentissage entreprises par les enseignants dans l'enseignement primaire et secondaire ?

Question de recherche liée à l'objectif 2

(4) Quelles sont les effets des activités d'apprentissage informel social sur les compétences d'employabilité et les comportements d'innovation au travail des enseignants ?

Cette question de recherche, pour être confrontée aux données récoltées, se décompose en six hypothèses de travail.

- *H1 : L'expertise professionnelle, l'anticipation/optimisation, la flexibilité et l'esprit d'équipe, spécifiquement, ont un effet positif sur les comportements d'innovation au travail des enseignants.*
- *H2 : Les activités formelles et informelles d'apprentissage ont un effet positif sur l'employabilité.*
- *H3 : Les activités sociales informelles d'apprentissage possèdent un lien plus fort avec l'employabilité que l'apprentissage formel.*
- *H4 : Les activités formelles et informelles d'apprentissage ont un effet positif sur les comportements d'innovation au travail.*

- *H5 : Les activités sociales informelles d'apprentissage possèdent un lien plus fort avec les comportements d'innovation au travail que l'apprentissage formel.*
- *H6 : Les cinq compétences d'employabilité, c'est-à-dire l'expertise professionnelle, l'anticipation/optimisation, la flexibilité et l'esprit d'équipe sont des médiateurs de la relation entre les activités formelles et sociales informelles d'apprentissage et les comportements d'innovation au travail.*

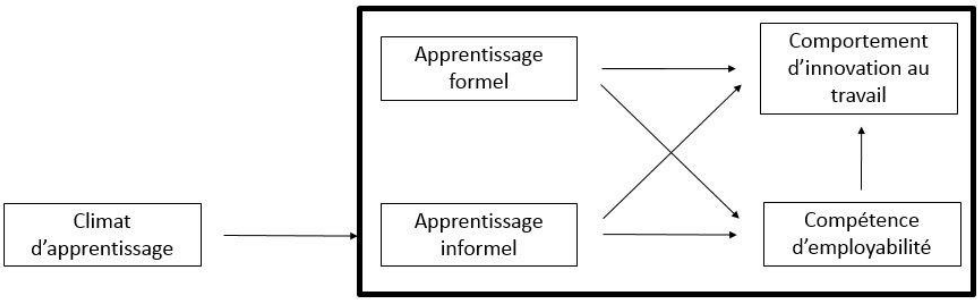

Figure 3. Point d'Attention du Deuxième Objectif

Question de recherche liée à l'objectif 3

(5) Quel est le rôle du climat scolaire d'apprentissage pour les activités informelles d'apprentissage des enseignants ?

Cette question de recherche, pour être confrontée aux données récoltées, se décompose en trois hypothèses de travail.

- *H1 : La facilitation de l'apprentissage (dimension 1 du climat d'apprentissage) est liée de manière significative et positive à toutes les dimensions des activités d'apprentissage social informel.*
- *H2 : L'appréciation de l'apprentissage (dimension 2 du climat d'apprentissage) est liée de manière significative et positive à toutes les dimensions des activités d'apprentissage social informel.*
- *H3 : Un climat d'évitement des erreurs (dimension 3 du climat d'apprentissage) est lié de manière significative et négative à toutes les dimensions des activités d'apprentissage social informel.*

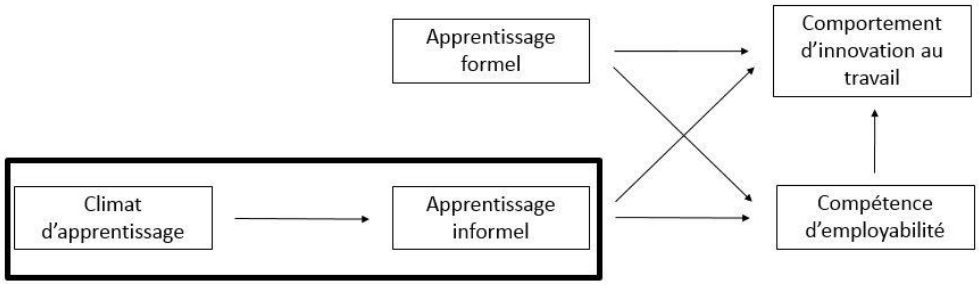

Figure 4. Point d'Attention du Troisième Objectif

4. Approche de recherche et choix méthodologiques

Au long du processus de la présente thèse, plusieurs choix de recherche ont été posés en regard des objectifs et des hypothèses, amenant leurs implications méthodologiques. Ces choix et leurs implications sont présentés et explicités ci-dessous.

Commencement de la thèse par une revue de littérature

Le premier choix méthodologique de la présente thèse a été de constituer un état des lieux de la littérature existante et de la vision actuelle du sujet de recherche principal. Cet état des lieux a permis par la suite de poser les jalons des études suivantes selon les spécificités du sujet de recherche et les questions qui émanent des études actuelles.

Complémentarité des approches inductive et hypothético-déductive

Dans un premier temps, la problématique des apprentissages formels et informels des enseignants a amené une approche essentiellement inductive pour établir la base théorique de la présente thèse à partir de la littérature existante et des informations récoltées sur le terrain. Ensuite, une démarche hypothético-déductive a permis, par le biais de deux études empiriques, de poser des hypothèses en fonction de cadres théoriques et de les appliquer en les confrontant empiriquement aux données récoltées.

Complémentarité des méthodes quantitative et qualitative

L'étude spécifique du phénomène de l'apprentissage des enseignants sur leur lieu de travail ne peut évidemment pas avoir lieu en dehors du contexte, scolaire et spécifique, dans lequel ce phénomène prend place. Cependant, deux méthodes, basées sur des paradigmes différents coexistent pour mesurer la réalité sociale. La présente thèse vise à assembler ces deux méthodes, qualitative et quantitative, au service de deux approches, une inductive et l'autre hypothético-déductive pour concilier ces deux paradigmes.

Premièrement, le paradigme interprétatif vise, par des méthodes qualitatives, à comprendre la réalité sociale de manière subjectiviste et relativiste en quête de significations. Ce paradigme sera utile pour aborder la réalité des apprentissages informels que les enseignants entreprennent au quotidien en leur donnant sens. Des entretiens semi-structurés

leur permettront de construire la réalité sociale qu'ils vivent au quotidien afin de la rapporter et de la comparer à celle des autres enseignants. Cette réalité construite a servi de point d'ancrage de la présente thèse.

Deuxièmement, sur la base de cette réalité sociale des activités informelles d'apprentissage des enseignants, construite au préalable, le paradigme positiviste, dans une volonté objectiviste, tente d'expliquer empiriquement les phénomènes rapportés de manière expérimentale, en leur conférant des valeurs chiffrées pour les mettre en relation avec d'autres concepts (compétences d'employabilité, comportements d'innovation au travail et climat scolaire d'apprentissage). Des données récoltées par questionnaires ont été utilisées dans des modèles d'équations structurelles, qui permettent d'objectiver et de généraliser dans une certaine mesure la réalité sociale en lui adjudant une puissance et des normes statistiques.

Tableau 1. Matrice des Données et Méthodes d'Analyses selon les Études

	Objectif	Méthode	Analyses	Origines des données	Échantillon
Étude 1	1	Qualitative	Revue de littérature systématique	9 bases de données	41 articles scientifiques
Étude 2	1	Qualitative	Analyse phénoménologique interprétative	Entretiens semi-structurés	41 enseignants d'écoles primaires et secondaires
Étude 3	2	Quantitative	Modèle d'équation structurelle	Questionnaires en ligne	301 enseignants d'écoles primaires et secondaires
Étude 4	3	Quantitative	Modèle d'équation structurelle	Questionnaires en ligne	467 enseignants d'écoles primaires et secondaires

5. Aperçu des chapitres

Le champ des activités informelles d'apprentissage des enseignants constitue le centre du domaine de recherches de la présente thèse. Pour rencontrer nos objectifs de recherche, il nous a paru essentiel de commencer, au chapitre 1, par présenter la problématique, avoir une première vision globale des sujets d'étude et présenter les objectifs de cette thèse.

Au chapitre 2, une revue systématique de littérature est présentée sur le sujet principal de cette thèse, à savoir les apprentissages informels des enseignants. Cette revue de littérature sera le premier jalon pour une vision complète du phénomène étudié. Elle permet une première discussion de la définition de l'apprentissage informel des enseignants et des moyens de le mesurer. Cette discussion nous amène ensuite à réaliser une analyse phénoménologique de la perception que possèdent les enseignants de leurs apprentissages informels sur leur lieu de travail et du contenu de celui-ci. Cette analyse qualitative fait l'objet du chapitre 3 et vise à identifier l'ensemble des activités perçues entreprises par les enseignants. La discussion de ce chapitre vient prolonger celle du chapitre précédent pour poser un cadre large du phénomène de l'apprentissage informel des enseignants et sert de tremplin pour les deux études empiriques qui suivent.

Deux études empiriques et quantitatives prolongent les questions et les discussions qui ont émergé lors des deux premiers chapitres. Elles s'inscrivent dans deux perspectives opposées.

La première étude, présentée au chapitre 4, place la focale sur les conséquents à l'apprentissage des enseignants. Les liens existant entre l'apprentissage formel des enseignants, leurs activités informelles sociales d'apprentissage, leurs cinq compétences professionnelles comprises dans le cadre de compétences d'employabilité et leurs comportements d'innovation au travail sont investigués. Au-delà de l'analyse des liens existants, la question des effets médiateurs des compétences d'employabilité des enseignants est aussi investiguée. Enfin, des questions de fond sur les impacts des différentes dimensions des activités informelles d'apprentissage des enseignants terminent ce chapitre.

À l'opposé de ce chapitre, la quatrième étude de cette thèse, présentée au chapitre 5, redirige la focale sur les antécédents des activités informelles sociales d'apprentissage, et en particulier sur la mise en place de climats scolaires d'apprentissage. Les différentes dimensions qui composent les climats d'apprentissage sont étudiées en fonction de leurs liens avec les composantes des activités informelles et sociales des enseignants, en tenant compte de leurs âges et du type de contrats.

Au terme de ces quatre études, la discussion générale de la présente thèse est proposée au chapitre 6. Cette discussion retrace en premier lieu la progression de la vision du sujet d'étude central le long du cheminement de la présente thèse. En second lieu, les résultats des quatre études sont rappelés et synthétisés au regard de l'ensemble du processus de recherche. Enfin, les conclusions et les apports substantiels des études qui composent la présente thèse permettent de mettre à jour des propositions et des perspectives futures de recherche.

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Chapter 2

Two decennia of research on teachers' informal learning

A literature review on definitions and measures

Abstract

Literature on teachers' workplace learning, more specifically, their informal learning has increased tremendously during the past two decades. The present study reviewed how these studies define informal learning and how informal learning is measured. Results showed that literature has been inconsistent in defining teachers' informal learning, resulting in a hodgepodge of what it really encompasses. Furthermore, no best practice has been established for the measurement of informal learning. The study concludes with a theoretical common definition of teacher's informal learning and summarizing ways of measurement.

Référence

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Two decennia of research on teachers' informal learning:
a literature review on definitions and measures

1. Introduction

The importance of informal learning (processes) for teachers' professional development is more and more acknowledged (Jacobs & Park, 2009). As the objective of educational institutions around the globe is to sustain in providing high quality and relevant education, they have to ensure that their staff is up-to-date on the latest developments regarding technology and emerging knowledge. Akin to other occupations, teachers are also affected by the continuous and fast-paced developments within the educational field (Kyndt, Gijbels, Grosemans, & Donche, 2016). In the past, the time it took for newly gained knowledge and skills to become obsolete for teachers who had completed initial teacher education would be lengthy, which is not the case anymore (De Grip, 2015; Kyndt et al., 2016). The professional development of teachers, and the way they learn, has seen a growth in the body of literature over the past few years. Schugurensky (2015) explains that informal learning has been made widely popular only since the late 20th century. In the existing literature on informal learning, a multitude of informal learning definitions have been used interchangeably, thereby somewhat overlapping each other (Meijiuni, Cranton, & Táíwò, 2015). Scholars differ in their definitional approach with regard to the features (e.g. accidental, spontaneous, implicit, self-directed) and the learning activities (e.g. reflection, trial-and-error, feedback seeking). Besides the fact that teachers' informal learning features and learning activities differ across papers, approaches can be different too. Some scholars prefer to define teachers' informal learning based on the stimulus (e.g. Eraut, 2000, 2004), while others focus more on the type of activity (e.g. Noe et al., 2013). Callanan, Cervantes, and Loomis (2011) corroborate that the definition of teachers' informal learning is dependent on the authors' interpretation of what it exactly comprises. Thus, as literature is not in unison on the definition of teachers' informal learning, a myriad of partially overlapping definitions is used (Clarke, 2005). Accordingly, a critical look of the literature on informal learning is needed in order to realize an integration of the research on teachers' informal learning allowing the distillation and unification of several findings into a coherent understanding of teachers' informal learning. Therefore, the purpose of this literature review is to synthesize existing literature and to give an overview of the different approaches of teachers' informal learning and streamline this into a unified definition. Research on teachers from all educational levels (primary, secondary and higher education) is included as a broad general definition and measurement serve as a foundation for further research. In order to look into teachers' informal learning definition, its features have to be inventoried too. Finally, this study adds to the existing literature by

bringing alignment in the educational literature with regard to the definition of teachers' informal learning.

Research question 1: How can the informal learning of teachers be defined?

Furthermore, by giving an overview of the ways teachers' informal learning has been measured, a starting point for examining and developing an advice of practice and instruments with regard to measuring informal learning is offered. As a multitude of measurement instruments of teachers' informal learning coexists, a first necessary step is to map the different ways of measuring it.

Research question 2: How was informal learning measured in prior research studies?

2. Method

In order to find relevant studies and thus relevant information, a primary search, a literature selection and analysis were completed through different phases. First, a literature search was performed within scientific databases, then irrelevant literature was excluded based on several criteria. Secondly, the selected literature was critically appraised to exclude low quality studies. Thirdly, the selected studies were analyzed following Aveyard's guidelines (2010).

2.1. Literature search

The literature search should be as transparent as possible (Kyndt & Baert, 2013; Pati & Lorusso, 2018). As this review study looks into teachers' informal learning, nine scientific databases from the education field were consulted: PsycINFO, PsycARTICLES, SAGE, ERIC, JSTOR, CAIRN, SpringerLink, Taylor & Francis and Wiley Online Library (through EBSCO and LibSearch). These databases were selected on the premise that they are widely-used and internationally acknowledged. For all the databases, the main search term was "informal learning". Given the study focus, this term was combined with either the terms "teach*", "professor", or "tutor". The literature search was conducted in July 2018 and resulted in 4029 search hits, presented in Table 2.

Table 2. Overview of Literature Search (July 2018)

Search Terms	ERIC	JSTOR	Taylor & Francis	SAGE	Wiley Online	Springer Link	Psych Info	Psych Articles
Teach* x Informal Learning	626	146	134	44	668	1134	89	1
Year Limit	*513*	*38*	*132*	*41*	*605*	*1127*	*86*	*1*
Faculty* x Informal Learning	86	2	13	8	184	449	2	0
Year Limit	*66*	*1*	*13*	*8*	*177*	*445*	*2*	*0*
Professor x Informal Learning	17	1	2	16	117	87	1	0
Year Limit	*12*	*1*	*2*	*16*	*102*	*83*	*1*	*0*
Tutor x Informal Learning	23	3	9	3	61	103	0	0
Year Limit	*23*	*2*	*9*	*3*	*40*	*103*	*0*	*0*
Total	752	152	158	71	1030	1773	92	1
+ Year Limit	*614*	*42*	*156*	*68*	*924*	*1758*	*89*	*1*
Overall Total								4029
+ Year Limit								*3652*

2.3. Literature selection

Articles from the literature search were then subject to exclusion criteria given the focus of the present study. As mentioned above, the selection process was followed step by step, using five exclusion criteria, in order to screen and exclude irrelevant articles.

(1) Articles published before 2000 were excluded, because informal learning only became increasingly popular in the late 20th century (Schugurensky, 2015) and studies have increasingly focused beyond the boundaries of formal learning from the year 2000 onwards (Bell, Tannenbaum, Ford, Noe, & Kraiger, 2017). The total articles that remained to be reviewed decreased to 3652 articles.

(2) In order to ensure a certain quality of the articles, studies not published in peer-reviewed journals were deleted. This step reduced the total number of articles to 1858.

(3) Because a good understanding is necessary in order to analyze studies correctly, studies in other language than English were deleted. Furthermore, double records from different databases were deleted. This brought the total articles to review to 1467.

(4) In order to focus the literature review on informal learning only, studies on formal learning only or on student learning were deleted. Articles' titles, and if necessary the abstracts too, were individually scanned on whether they focused on informal learning of teachers. This step caused a substantial decrease in the potential studies to be analyzed, as the total articles were brought down to respectively 188.

(5) Studies that focus on teachers in alternative education programs or pre-service teachers were also eliminated. Only studies on in-service teachers were kept. Therefore, the number of articles to be assessed was brought down to a total of 43 articles.

Forty of these forty-three articles were retrieved and downloaded. Three articles were not directly accessible and, therefore, the authors of the studies were contacted through ResearchGate for a request of the full text. Since the authors did not respond, the articles could not be included in the analysis.

This review study also made use of the snowball method by scanning the reference lists of the studies by which five additional articles were identified: Lohman (2006); Hoekstra, Beijaard, Brekelmans, and Korthagen (2007); Hoekstra, Korthagen, Brekelmans, Beijaard, and Imants (2009); Henze, van Driel, and Verloop (2009); Grosemans, Boon, Verclairen, Dochy, and Kyndt (2015). The additional articles were fully scanned and, consequently, included for the last step. The initial search was conducted in July 2018 and some months passed before a first draft of the manuscript was completed. At that time, the authors searched the literature again, using the same procedure, to see if any articles published during those month fit the criteria. Two more articles were added: Lecat, Beausaert, and Raemdonck (2018) and Zhao and Ko (2018).

This final step included scrutinizing the full texts. As a result, five articles were deleted during this phase. Reasons for elimination included that the first study was a literature review not measuring teachers' informal learning and using the same definition than another article

of the sample. The second excluded study was focused more on the importance of teachers' informal learning rather than examining it and as such did not provide relevant information for answering the research questions of this study. The third deleted article was not making enough distinction between formal and informal learning by blending it into the term professional development. The two last articles were focusing solely on the context in which teachers learn and work instead of studying informal learning. Ultimately, 42 articles served as a foundation for the synthetization teachers' informal learning.

2.4. Critical appraisal

The quality of the 42 selected studies was evaluated using widely-used critical appraisal tools. The qualitative studies (n = 26) and the mixed-methods studies (n = 5) were scanned using the guidelines from the Critical Appraisal Skills Programme (CASP; Singh, 2013). The quantitative studies (n = 11) were assessed based on the CASP guidelines, with the questions used by Pluye, Gagnon, Griffiths, and Johnson-LaFleur (2009).

The general criteria that the articles had to fulfil were (1) that a clear purpose of the study was mentioned; (2) that an appropriate methodology, research design, and recruitment strategy, data collection was chosen to conduct the study; and (3) that the results were clearly stated and rigorous. The articles were assessed and given a rating of high (more than 70% of answers are "Yes"), medium (between 40% and 70% of "Yes"), or low (less than 40% of "Yes"). Low-quality studies were excluded from the analysis.

Critical appraisal rating of low-quality means that not enough information was provided in the article to fulfill the quality criteria, not that the actual execution of the study was poor. For example, it appeared that none of the qualitative studies (n = 26) explicitly discussed taking into account the relationship researcher-participant and/or potential ethical issues. Taking into account the relationship between researcher and participant, means that the author(s) explicitly examined the effect and potential bias they might have on the study in the formulation of the research question(s) and the collection of data, recruitment of participants, and choice of location where the study took place (CASP, 2013). This was not present in most of the qualitative studies (n = 20). The consideration of ethical issues, that is whether the study was clearly explained to the participants, whether confidentiality and consent were guaranteed by the author(s), or whether approval of the ethics committee were sought (CASP, 2013), was also not discussed by most of the qualitative studies (n = 21). This could be explained because researches about teachers' informal learning does not require participant deception, hazards of confidential patient information and then, do not need an ethics committee approval. After critically evaluating all qualitative studies, one study received a low-quality score. Concerning mixed-method and quantitative studies, no article received a low score. A small part (n = 3) of the quantitative studies and the majority (n = 4) of the mixed-method studies received a medium score. In the end, 41 articles remained after only including medium to high quality studies for this systematic literature review (see Appendix A, Appendix B and Appendix C).

2.5. Data analysis

For the analysis, the studies were fully read again and the features of each study were noted down. As with the literature selection and appraisal, likewise the analysis followed a specific procedure.

The first research question of this review study is concerned with analyzing definitions of teachers' informal learning. This will then make it possible to generate a general definition of teachers' informal learning. In order to know what encompasses teachers' informal learning definition, its features and the learning activities from which they informally learn have to be inventoried. Therefore, a (summative) content analysis was used for the coding and mapping. This way, the underlying context could be interpreted by comparing keywords and content of the studies (Toracco, 2005). Furthermore, an inductive analysis was performed to be able to make inferences about forming a definition on teachers' informal learning.

The second research question is concerned with the measurement of informal learning. This study started by reading all the selected methods while noting down how each study had set up their methodology for measuring teachers' informal learning. Also, here, the various measurements were coded and analyzed by means of a (summative) content analysis. This way, a better insight is given into the variety and concurrence between the reviewed studies on which measurement method is used most often.

3. Results

This section will first give the reader an overview of all the studies selected and their characteristics. Then the first research question will be addressed by comparing definitions reported in the studies and then inventorying features of teachers' informal learning. Finally, this results section will end by looking at how teachers' informal learning has been measured in the selected studies.

3.1. Characteristics of the selected studies

There were differences among the studies with regard to the educational level where the sample of teachers taught. The majority, 16 of the reviewed studies looked solely into teacher who taught at secondary level or high school (e.g., Aown, 2011; Bakkenes, Vermunt, & Wubbels, 2009; Henze et al., 2009; Hoekstra et al., 2007; Kang & Cheng, 2014) and 11 solely looked into teachers at tertiary level or in university/college (e.g., Gerken et al., 2016; Harrison & McKeon, 2008; Van der Klink, Van der Heijden, Boon, Williams van Rooij, 2014; Van Eekelen, Boshuizen, & Vermunt, 2005, Viskovic, 2005). Only one of the selected studies, Schei and Nerbø (2015), looked into teachers in kindergarten and only two of the selected studies focused solely on elementary teachers (Jurasaite-Harbison, 2009; Grosemans et al., 2015). Ten looked into multiple educational levels such as elementary and secondary combined (n = 7) (e.g., Flores, 2005; Lecat et al., 2018; Tarc, 2007), secondary and tertiary combined (n = 1) (e.g., Springer, 2016), or even all educational levels except kindergarten (n = 2) (e.g., Hanraets, Hulsebosch, & De Laat, 2011; Lohman, 2005). Finally, two studies did

not specify explicitly the educational level in which their study was set up (Krauss & Guat, 2008; Rehm & Notten, 2016).

The majority (twenty-two) of the studies originated from a country in Europe, mainly done in The Netherlands (thirteen studies; e.g. Bakkenes et al., 2009; Hoekstra & Korthagen, 2011; Van Eekelen et al., 2005), two in Belgium (Grosemans et al., 2015; Lecat et al., 2018), two in Germany (Rehm & Notten, 2016; Richter et al., 2011), two in the United Kingdom (Knight, Tait, & Yorke, 2006; Wilson & Demetriou, 2007), one in Portugal (Flores, 2005), one in Norway (Schei & Nerbø, 2015) and one in both Sweden and Norway (Reichenberg & Andreassen, 2018). Twelve studies had their origins in America: eleven in the United States (e.g. Davis, 2015; Springer, 2016; Thacker, 2015) and one in Canada (Tarc, 2007). Three studies were executed in Asia: two in Malaysia (Krauss & Guat, 2008; Rashid, 2018) and one in China (Kang & Cheng, 2014). In Oceania, two studies originated from Australia (Thomson, 2015; Thomson & Trigwell, 2016) and one from New Zealand (Viskovic, 2005). Finally, two studies were cross-cultural. One done in United States and Lithuania (Jurasaite-Harbison, 2009) and the last one in various European countries, Israel and United States (Harrison & McKeon, 2008).

The sample of teachers in the selected studies also varied with regard to their experience level. Almost half of the selected studies, 48 percent, (n = 20) focused on the experienced teacher, that is, a teacher that has two or more years of teaching experience (e.g., Van der Klink et al., 2014; Richter, Kunter, Klusmann, Lüdtke, & Baumert, 2011; Schreurs, Huveneers, & Dolmans, 2016; Thacker, 2017; Thomson & Trigwell, 2018). The first years of the teaching career trajectory focus on getting to know the work context, forming teacher identity, and dealing with student's behaviour (Kyndt et al., 2016). And almost a quarter, 24 percent of the studies (n = 10) focused on both inexperienced and experienced teachers (e.g., Jones & Dexter, 2014; Thomson, 2015; Van Lankveld, Schoonenboom, Kusurkar, Beishuizen, Croiset, & Volman, 2016). Only 10 percent (n = 4) of the studies focused solely on the inexperienced teacher (Hanraets et al., 2011; Kang & Cheng, 2014; Krauss & Guat, 2008; Wilson & Demetriou, 2007). The remaining 19 percent (n = 8) of the studies did not specify the experience level of their teacher sample (e.g., Jurasaite-Harbison, 2009; Knight, Tait, & Yorke, 2006; Pifer, Baker, & Lundsford, 2015). Kyndt et al. (2016) in their review study looked into the differences between experienced and inexperienced teachers and found that in terms of informal learning activities undertaken they do not differ much apart from experimenting and reading. Few of the selected studies (n = 2) also focused on individual dispositions (e.g., Lohman, 2000, 2005) or contextual factors (n = 8) that influence participation of teachers in informal learning activities (e.g., Kang & Cheng, 2008; Lohman, 2000, 2003, 2005, 2006; Wilson & Demetriou, 2007).

Furthermore, the vast majority, approximately 81 percent, of the selected and reviewed studies (n = 34), focused on understanding the informal learning activities teachers learn (most) from (e.g., Henze et al., 2009; Knight et al., 2006; Grosemans et al., 2015). Approximately 19 percent of the articles (n = 8) examined, besides examining informal learning activities, factors that affected teachers' engagement in informal learning activities (e.g., Lohman, 2003, 2005, 2006) and seven percent of the selected articles (n = 3) that

examined factors that affected teachers to disengage in informal learning activities (Collinson & Cook, 2004; Krauss & Guat, 2016; Lohman, 2000). Moreover, 20 percent of the studies (n = 8) explicitly mentioned or looked into the types of learning (using terms like dimensions, features, or types) when teachers informally learn.

3.2. Teachers' informal learning definitions

The problem with the construct of teachers' informal learning is that up until now no general definition has been established. As a consequence, the selected studies differed in their idea of what teachers' informal learning encompassed. For instance, some authors mainly identified the informal learning of teachers as the conscious or unconscious decision to engage in learning activities that ultimately lead to a modification in either behaviour or cognition (Hoekstra et al., 2007; Hoekstra, Brekelmans, Beijaard, & Korthagen, 2009; Hoekstra, Korthagen et al., 2009). They take into account that teachers' informal learning is not merely behavioural and cognitive, but also motivational and emotional in nature. Schei and Nerbø (2015), similar to the studies by Hoekstra and colleagues (Hoekstra et al., 2007; Hoekstra, Brekelmans et al., 2009; Hoekstra, Korthagen et al., 2009), defined informal learning as learning that is not undertaken in a systematic manner. However, they add that informal learning predominantly takes place in everyday (work) situations. They contend that informal learning happens haphazardly and often by change rather than planned with a predetermined agenda. Furthermore, Schei, and Nerbø (2015) include in their definition that the objective of engagement in informal learning activities is to acquire and use new skills and knowledge. Lohman (2000, 2003, 2005, 2006) shares the perspective of Schei and Nerbø (2015) that the end goal of informal learning is to obtain new skills and professional knowledge. However, different from the definition by Schei and Nerbø (2015), is that Lohman (2000, 2003, 2005, 2006) defines informal learning as a feature of workplace learning which encompasses learning activities consciously initiated by employees in the workplace. In accordance with Hoekstra and colleagues (Hoekstra et al., 2007; Hoekstra, Brekelmans et al., 2009; Hoekstra, Korthagen et al., 2009), Lohman (2005) states that learning from informal activities requires effort by the individual in physical, cognitive, and emotional terms. Another example is that of Jurasaite-Harbison (2009): she is more general in defining informal learning as she defines it as the unplanned or spontaneous learning that can be developed from multiple sources and in multiple contexts. Jurasaite-Harbison (2009) emphasizes that a community of practice and the interaction between individuals within that community of practice is a valuable working environment and motivator for engaging in informal learning. The definition of informal learning used by Grosemans and colleagues' (2015) has similarities and differences to the abovementioned definitions. Similarities include that individuals do not systematically engage in informal learning activities and arises often from daily work situations, activities, and routines. Furthermore, Grosemans and colleagues (2015) argue, as informal learning takes place spontaneously and mostly unconsciously, it is not clear what the exact learning outcomes will be. These authors expect individuals engaging in informal learning to develop their professional knowledge and skills. However, they differ from other authors in terms of making explicit that informal learning occurs both on an individual and collectively level.

In sum, some of the definitions correspond to informal learning taking place in everyday work situations, consciously initiated by teachers. Others have the outcome of spontaneously and unconsciously advancing professional knowledge and skills. Other definitions highlighted the aspects of informal learning being emotional, physical, and cognitive in nature. Nevertheless, the definitions are only partly overlapping as none of the definitions are identical in terms of features mentioned.

3.3. Features of teachers' informal learning

The features of informal learning were also inventoried. Approximately 40 percent (n = 17) of the selected studies specifically mentioned the features of teachers' informal learning. The results are depicted in Table 3. As can be viewed, the features of informal learning are diverse and sometimes even opposite. For instance, the reviewed studies are not in accordance whether informal learning of teachers is planned or unplanned. A couple of the selected studies mentioned that the informal learning of teachers is intentional, or planned (n = 6). Features that are worded differently but could be placed in this group are: deliberate (n = 3). These features grouped together view informal learning as being an activity that is intentionally engaged in. Some studies also mentioned that informal learning is unintentional, or unplanned (n = 5). Features that have overlap are accidental learning (n = 1), incidental learning (n = 1), implicit learning (n = 2) spontaneous learning (n = 2), reactive learning (n = 2), and unpredicted learning (n = 1). These features grouped together view informal learning as happening unintentionally and rather by chance. The individual is not consciously aware that he or she is informally learning. Moreover, some of the selected studies (n = 5), mentioned that informal learning of teachers is self-directed, meaning that the learning is under the individual teachers' control rather than controlled by others. Closely related to the feature 'self-directed', Thacker (2015) described informal learning as being 'self-guided'. Even though a different term is used, there is no difference between its meaning and that of 'self-directed'. Two studies also mentioned that informal learning is 'unstructured', which means that there is no systematic support for informal learning in place. Furthermore, Wilson and Demetriou (2007) suggest that informal learning is 'experiential' and should rather be viewed as learning while doing or experiencing. The emphasis is placed on the consciousness level by focusing on the level of intention or planning or lack thereof. In sum, a myriad of terms is used to describe the features of teachers' informal learning. When grouped together, the most often mentioned features are self-directed learning (n = 6), unintentional learning (n = 15), or intentional learning (n = 10).

Table 3. Features of Teachers' Informal Learning

Features	**Author(s)**
Accidental (1)	Schei & Nerbø (2015)
Deliberate (4)	Jurasaite-Harbinson (2009); Hoekstra et al. (2007); Lecat, Beausaert & Raemdonck (2018); Wilson & Demetriou (2007)
Experiential (1)	Wilson & Demetriou (2007)
Implicit (2)	Hoekstra, Brekelmans et al. (2009); Wilson & Demetriou (2007)
Incidental (1)	Viskovic (2005)
Independent (1)	Jones & Dexter (2014)
Intentional (2)	Knight et al. (2006); Kwakman (2003)
Non-linear (1)	Van Eekelen et al. (2005)
Planned (3)	Bakkenes et al. (2007); Van Eekelen et al. (2005); Wilson & Demetriou (2007)
Reactive (2)	Hoekstra et al. (2007); Wilson & Demetriou (2007)
Self-directed (5)	Aown (2011); Hoekstra, Brekelmans et al. (2009); Kwakman (2003); Lohman (2003); Van Eekelen et al. (2015)
Self-guided (1)	Thacker (2015)
Situated (2)	Harrison & McKeon (2008); Viskovic (2005)
Spontaneous (2)	Jurasaite-Harbinson (2009); Grosemans et al. (2015)
Unintentional (1)	Knight et al. (2006)
Unplanned (4)	Lecat, Beausaert, & Raemdonck (2018); Schei & Nerbø (2015); Van Eekelen et al. (2005); Wilson & Demetriou (2007)
Unpredicted (1)	Flores (2005)
Unstructured (2)	Grosemans et al. (2015); Schei & Nerbø (2015)

3.4. Teachers' informal learning measurement

3.4.1. Inventory

This section looks at how the informal learning of teachers has been measured. The inventory phase identified 102 non-unique measurements of informal learning (by counting all measurements in the studies), which resulted in 32 unique instruments (by counting the number of different instruments). Most of the studies (n = 30) made use of a combination of measurements. Content analysis identified six categories in which the types of measurements of teachers' informal learning go.

Table 4. Measurement of Informal Learning

Case study	**Interviews**	**(Online) Survey**	**On site**	**Personal reports**	**Others**
Multiple Case Studies (8)	Semi-structured Interviews (20)	Questionnaire (12)	Observations / visits (9)	Written Reports via Email (2)	Reviewing documents (2)
Single Case Study (3)	Open interviews (5)	Survey (7)	Field Notes (4)	Twitter Data (Tweets) (2)	Pre-interview request sheet (1)
	Interview (non-specified) (4)	Questionnaire to Pupils about Teacher (2)	Recording of lessons (3)	Facebook Timeline (1)	Storyline method (1)
	Focus Group (3)	Pre-interview Survey (1)	Recording of supervision meetings (1)	Electronic Diary Study (1)	Reviewing of planning and lesson materials (1)
	Follow-up Interviews (2)	Post-interview survey (1)	Recording of researcher impression after interview (1)	Digital Logs (1)	
	Group interview (1)	COACTIV study (1)			
	Electronic interview (1)				
	Telephone interview (1)				

The first category concerns the use of case studies, either multiple or single. A total of 11 studies used a case study research design. The second category concerns the use of interview for measuring informal learning, which was used in the majority of the studies (n = 37). The methods ranged from semi-structured (n = 20) for the majority to group interviews (n = 1), follow-up interviews (n = 1), electronic interviews (n = 1) and telephone interviews (n = 1).

The third category concerns the use of a questionnaire or survey (n = 23). Measurements in this category range from the use of (online) questionnaires (n = 19) to post-interview surveys (n = 1) and COACTIV study (n = 1). The COACTIV study was a part of the German extension of the 2003 European PISA (Programme for International Student Assessment). The fourth category concerns on site measurements. In some studies, researchers visited and observed teachers in schools (n = 9) or took fields notes (n = 4). Recordings of lessons (n = 3), supervision meetings (n = 1) and researchers' impression (n = 1) were also analyzed to gain information. The fifth category comprised seven studies that made use of an approach using written reports that build on the participants' perspective. Some studies used digital logs (n = 1), written reports via emails (n = 2), Facebook timeline (n = 1), electronic diaries (n = 1), or looked at Twitter data of participants (n = 2). Lastly, in the sixth category, researchers reviewed schools documents (project materials or institutional policy; n = 2) or lessons preparation (n = 1). They also used a storyline method (n = 1), pre-interview request sheet (n = 1). The storyline method is built on a teacher's representation of a series of experiences or events (vertical axis on 5-point scale in the one from Henze, van Driel and Verloop, 2009) and plotted in time on the horizontal axis. This method is not in the fifth category because it is not based on written reports. The results of the content analysis are depicted in Table 4.

As mentioned before, 30 studies used a combination of measurements (e.g. Aown, 2011; Collinson & Cook, 2004; Hanraets et al., 2011; Tarc, 2017). Often, the combination involved a case study or survey combined with semi-structured interviews (Hoekstra, Korthagen et al., 2009; Kang & Cheng, 2014; Rashid, 2018; Schei & Nerbø, 2015). However, additional measurements were undertaken such as on-site observations (n = 9), taking field notes (n = 4), or recordings of lessons and/or meetings (n = 5). Several studies (n = 11) relied only on one measure, predominantly the use of surveys (e.g. Hoekstra, Brekelmans et al., 2009; Krauss & Guat, 2008; Richter et al., 2011; Springer, 2016; Van der Klink et al., 2014). Table 5 show a ranking of the most used measurements.

Table 5. Ranking of Teachers' Informal Learning Measurement

Ranking	Type of Measurement Used	Number of Studies	Percentage
1	Semi-structured Interviews	20	49%
2	Questionnaire /survey	19	46%
3	Observations/visits	9	22%
4	Multiple Case Study	8	20%
5	Open Interviews	5	12%
6-8	Interviews (non-specified)	4	10%
	Diary study	4	10%
	Field Notes	4	10%
9-11	Single Case Study	3	7%
	Focus Group	3	7%
	Recording of lessons	3	7%

3.4.2. Description

It became apparent that the most used way of measuring informal learning was through semi-structured interview as nearly half of the studies (n = 20) made use of this measurement. Not all studies specified the guidelines for the interviews (e.g., Flores, 2005; Grosemans et al., 2015; Schreurs et al., 2016). Furthermore, most authors did not indicate the questions they asked during semi-structured interviews (e.g. Lohman, 2000; Wilson & Demetriou, 2007) but sometimes general information is given, such as "(interviews) examine further the ways in which teachers learn in the workplace" (Flores, 2005, p. 488) or "(the interview) explored the informal learning activities of the teacher" (Grosemans et al., 2015, p. 154). Only four articles included semi-structured interview guide (Hanraets et al., 2011; Lohman, 2003; Schei & Nerbo, 2015; Van Lankveld et al., 2016). Given these general information and interview guides, typical questions aim to retrieve which learning activities are done by teachers (e.g. Hanraets et al., 2011; Van Eekelen et al., 2005), for instance "the teachers were asked to give examples of situations or activities from which they had learned something" (Van Eekelen et al., 2005, p. 454). Others questions were about sources of learning, for instance "Primary questions concerned sources of information for learning about technology integration" (e.g. Jones & Dexter, 2014, p. 373) or about their professional development experiences, for instance "The interview guide covered the following areas: (1) educational background; (2) professional development experiences; (3) reflections on teaching; (4) conceptions about EFL (English as a Foreign Language) learning and teaching; (5) comments on the environment of teaching" (e.g. Kang & Cheng, 2014, p. 173).

Some authors elaborated their approach during interviews by also taking into account learning from critical incidents, the work itself, or the organization of work (e.g. Lohman, 2003; Schei & Nerbø, 2015). Van Eekelen et al. (2005) not only looked into activities or situations the teachers had informally learnt from, but also looked into how they individually defined informal learning ("the teachers were asked how they would define learning and what learning goals (if any) they had for the following two months.", p. 454). Harrison and McKeon (2008) specifically asked five experiences during the first year of their new work.

The second most used measurement was through (online) questionnaires or surveys (n = 19) accounting for the measurement of 46 percent of all studies included in this review. While the guidelines for the surveys were rarely discussed explicitly, most of the studies made use of surveys where teachers indicated the learning activities they undertook and learned most from (par ex. Henze et al., 2009; Springer, 2016; Tarc, 2017). In studies using questionnaires, the smallest number of items is 10, on a 5-point Likert scale, to measure 4 dimensions of social informal learning (Gerken et al., 2016). These dimensions are (1) feedback seeking from supervisor, (2) feedback seeking from colleagues, (3) external information seeking and (4) help seeking. The biggest number is 61 items, on a 4-point Likert scale to measure 4 dimensions of teachers' professional learning (Flores, 2005). These dimensions are (1) the nature and scope or professional learning, (2) processes and contexts of learning, (3) factors influencing teachers' professional development and (4) school culture and leadership. The study using the most dimensions is the one from Lecat et al. (2018) in which social informal learning is assessed on basis of 6 dimensions, each with 5 items. These dimensions are (1)

feedback seeking frequency, (2) help seeking frequency, (3) information seeking frequency, (4) feedback use, (5) help use and (6) information use. Two articles did not report the exact number of items (Grosemans et al., 2015; Springer, 2016) but refer to a validated questionnaire and indicate they have added some items.

Not all questionnaire are based on self-reports by teachers. Hoekstra and Korthagen (2011) made use of a different information sources, for instance teachers and students' perceptions when measuring teachers' informal learning. In this study, pupils filled out a survey before –and after their teacher completed the questionnaire. The rationale for doing so, Hoekstra and Korthagen (2011) state, is that research showed that the judgment of pupils demonstrated to be trustworthy when measuring teachers' behaviour. While this does not take into account possible negative teacher-student relationships and does not capture teachers' learning as a whole, it provides an external perspective on teachers' progress through engagement in informal learning activities.

The third most used measurement was on site observations or visits (n = 9), that is about 22% of the selected studies. Schools visits and observations are made to gain information about unconscious (or unremembered) informal learning activities. It also can lead to a better understanding of participants' workplaces and the settings for informal learning. For instance, Lohman (2003) used in site visits to confirm findings from interviews, in order to enhance the credibility of what she found. Schei and Nerbo conducted all interviews on site in order to have a better view of the work settings so to add information to complete their data.

3.4.3. Strengths and weaknesses

Currently, no best practice is established for the measurement of informal learning, the approaches as depicted in Table 5 each have their strengths and weaknesses for measuring teachers' informal learning. Below the three most used methods for measuring teachers' informal learning are discussed in detail.

First of all, measuring teachers informal learning using semi-structured interviews has the advantage of both having a predetermined set of questions to help teacher to remember their learning activities and the flexibility of approach to questioning teachers' informal learning to let them finely express how they learn.. However, as there is more room for supplementary questions to ask and reacting on chat teachers said, it becomes more difficult to compare the interviews with each other as answers or even questions can diverge (Kothari, 2004). Another drawback on this approach is that it is more time consuming for teachers to answer and for researchers in terms of conducting the interviews and transcribing the unstructured responses. As a result, studies using semi-structured interviews have both less participants than other research designs and because of the time needed, the teachers' participation rate is lower than for instance a study asking them to answer online whenever they want. Despite these weaknesses, semi-structured interviews allows researchers to go more into detail and in a more exploratory way than for instance using a structured interviews or a survey with an imposed definition of informal learning and a limited freedom in the questions and directions (Kothari, 2004). Therefore, with regard to capturing informal learning activities or processes,

some may not come directly to mind and interviews allows to go back on questions and make it easier to explain again. Furthermore, in-depth questions can be spontaneously generated throughout the interview.

Secondly, the approach of measuring informal learning through (online) questionnaire has been used by 44 percent (n = 18) of the selected studies. The strength of using surveys as a measurement tool for teachers' informal learning is that it is cost-effective in terms of time and money for the participants (Kothari, 2004). Furthermore, a higher percentage of teachers can be reached by sending the questionnaire to the schools principals or via social media. However, teachers who learn the least informally may think they have nothing to say and, consequently, this may cause a bias as only those participants respond who have learned informally (Kothari, 2004). As a certain percentage and proportion has to be reached in order to be representative for the teacher population within the respective educational levels, and then allowing generalization, this method is likely to be one of the slowest method (Kothari, 2004). Furthermore, another drawback of sending questionnaires to teachers is that the individual dispositions or emotions of teachers on the spot cannot be taken into account as there is no face-to-face encounter with the researcher. Multiple researchers have made use of (online) surveys, however, only one researcher (Collinson & Cook, 2004) has made use of both a pre-interview survey and post-interview survey in addition to augment teachers impressions and opinion with statistical scores. This way, the increase of a teacher's knowledge base on a particular subject as a result of engaging in informal learning behaviour can be measured through the use of benchmarks and repeated questionnaires or surveys.

Thirdly, teachers case studies were also often used as a measurement for informal learning, as 27 percent (n = 11) of the selected articles made use of a multiple case study (n = 8) or a single case study (n = 3). While case studies offer the best approach to go in-depth on the informal learning processes of teachers, it is difficult to create a case study that suits all subjects while at the same time be able to generalize the findings to a larger group. The abovementioned ways – interviews, surveys, and case studies, have been frequently used to measure teachers' informal learning. One issue of concern remains that, as informal learning is often believed to be a highly unconscious process, informal learning for participants might be hard to pinpoint and, consequently, hard to measure. Then participants may report the most conscious learning activities but these may not be the most frequently used.

Lastly, in 22 percent (n = 9) of the selected studies, researchers made visits or observations in schools. The strength of this research method, is that it allows to directly check the accuracy of the data through the observed participant. Observation enhances the reliability of the learning behaviours reported. It allows to see unconscious learning activities that teachers are not aware of and also avoids desirability biases. These are strengths are not found in self-report measures. The main weakness is the time the observations take and the necessity of having two or more analysts in order to ensure inter-judge reliability (Stigler, Gallimore, & Hiebert, 2000).

4. Conclusion and discussion

Even though the body of literature on teacher learning increased over the past few years, the existing research and theory on teacher learning has been dealing with a lack of clarity surrounding the concept informal learning (Clarke, 2005; Hoekstra et al., 2007; Schugurensky, 2015). Informal learning is still often viewed by existing literature as a global category containing what does not refer to formal learning or is mistakenly used as a synonym for workplace learning. Consequently, literature to date has been unsuccessful in constructing a comprehensive definition for teachers' informal learning.

The first purpose of this study was to generate a theoretical framework and streamline this into a general definition of informal learning of teachers.

(1) How can the informal learning of teachers be defined?

Based on the preceding analysis and results, it became clear that teachers' informal learning takes different forms. With regard to the features of learning it was found to be 'self-directed', 'intentional', and 'unintentional'. As a result, after reviewing the selected studies and taking into account the dimensions and features of informal learning activities, this study proposes the following definition on teachers' informal learning as:

> Intentionally or unintentionally engaging in individual or collective, interactive or non-interactive, and instructive or self-directed activities that enhances the professional development of knowledge and skills. These learning activities can be deliberate or implicit. They include, but are not limited to, reflecting; reading; interacting and collaborating with colleagues; feedback giving and receiving; and the sharing of experiences and ideas.

The significance of the proposed definition is that it acknowledges and takes into consideration the different activities teachers prefer to undertake and the features of informal learning, thereby accounting for a more complete picture on teachers' informal learning. While this definition is non-conclusive, it serves as a starting point for alignment and the furthering of the educational literature on teachers' informal learning.

The second aim of the study was to map the ways informal learning of teachers has been measured in the past.

(2) How was informal learning measured?

This review study mapped the measurements of the selected studies. We will give advice on measurements use and suggest some alternative innovative methods.

It was found that most studies make use of qualitative approach when researching teachers' informal learning. Furthermore, in qualitative approach, semi-structured interviews with teachers were the most used. This technique has strength and weakness. First of all, according to Diefenbach (2009), it allows more methodological freedom and creativity, especially when the concept, like informal learning, can be vague or can be interpreted by teachers. In this sense, face-to-face interviews allows the researchers to reformulate the

research question, specify what the concepts really mean and what it encompass. In this study, we suggest that a combination of semi-structured interviews, questionnaires and observations are a good way to capture teachers' informal learning, but it can be completed with other more innovative methods.

Since semi-structured interviews provide a structured set of open-ended questions, which could include what learning means for an individual (Van Eekelen et al., 2005), which informal learning activities an individual undertakes and what the inhibitors and motivators are to engage in informal learning. Furthermore, by making use of benchmarks measured through repeated surveys or questionnaires, including a pre- and post-questionnaire, both for the teacher him/herself, as in the study by Collinson and Cook (2004) and his/her students, as in the study by Hoekstra and Korthagen (2011) people's impressions and opinions on a particular subject can be measured at different points in time. This is in line with the findings of the literature review by Kyndt et al. (2016) who found and stated that a mixed-method approach is most suitable in capturing teachers' informal learning.

Interviews and questionnaires can give a good overall view on teachers' learning activities and what is important to them. However, these research methods assume that teachers are mostly conscious of their informal learning. Measuring informal learning most allow to measure implicit learning as well. Direct observation as the third most used measurement method in the selected studies, can add a more objective view on interactions, learning contexts, working alone time, the variety of working tasks and behaviors that offer opportunities for informal learning. Moreover, video observation to assess teachers learning activities can more easily capture the complexity of interactions that can be submitted to the analysis of several researchers and enhance inter-judge reliability (Stigler, Gallimore, & Hiebert, 2000). The benefits of the video observation include obtaining a record of small group interactions generally not doable with an observer (Borko et al., 2008). However, observation mainly focus on social informal learning and does not take into account individual learning, for instance learning by reflection.

The current measurement approaches in the literature like the one discussed above can benefit from other more objective and innovative options. These alternative measurement methods can be used in addition to the existing instruments to help capturing teachers' informal learning, especially by taking into account the social dimension and the context in teachers' informal learning. For instance, socio-metric badges and social network analysis are two methods that can be added to the more commonly used instruments to increase the social learning activities remembered by teachers. Socio-metric badges are key-sized devices worn by teachers to measure interactions and discussion time (Kim, McFee, Olguin, Waber, & Pentland, 2012). It can bring a unique perspective of teachers' social informal learning. These devices make a continuous data collection easier even as teachers move throughout the day and its interactions (coffee break, lunch discussions, shared-space interactions, etc.). This information, reported to teachers, can help them to remember the various discussions they had and the colleagues to whom they seek feedback, help or information. Another additional method is social network analysis, a methodological approach designed to systematically map teachers' network configuration ex nihilo (Coburn & Russell, 2008). This network

information can track all interactions between teachers, and help them to report all social learning activities they had (Carrington, Scott, & Wasserman, 2005).

Limitations and future researches

This literature review considered informal learning definitions, features and ways of measurement. This review study attempted to take into account numerous aspects that informal learning of teachers comprises but also has some limitations. Accordingly, suggestions and directions for future research on informal learning are made.

First, this review combines studies from various countries and diverse educational systems. Nawab (2011) showed that teacher's workplace and informal learning can vary across different countries and so can, in this sense, definitions and measures. Future research can make cross-cultural comparisons. Furthermore, this review only looked into peer-reviewed published journals, causing a potential publication bias and limiting the generalizability of the results. A future literature review can search studies from different sources and collect published and unpublished papers.

Moreover, even though this study took an all-encompassing approach and tried to grasp the concept of teachers' informal learning, the definition was based upon the information and findings available in selected studies and, therefore, remains inconclusive. Hodkinson and Hodkinson (2005) claim that the nature of learning interacts with, among others, personal dispositions and the practice and culture at the workplace. This also became apparent in the additional topics discussed in the selected studies, since these separate aspects of informal learning were already investigated. For instance, constraints and promotors for engaging in informal learning activities as well as contextual factors were mentioned in the selected studies (Hoekstra et al., 2007; Kraus & Guat, 2008; Lohman, 2000; Wilson & Demetriou, 2007). Not only the way of learning but also the preference of undertaking informal learning activities differ between individuals. Consequently, a recommendation for future research is to – based on the theoretical framework provided above – extend and research the literature incorporating antecedents, individual preferences, personality traits, individual activity paths and consequences of informal learning in order to gain a more exhaustive notion of what encompasses teachers' informal learning.

This review study also provided an overview of the measurements of informal learning. A typology of most used ways of measuring informal learning was developed and the strengths and weaknesses of the most used measurements discussed. To date, no research has been done as to what might be the best order to measure informal learning. This review study suggests that a multi-source design is appropriate by including semi-structured interviews, questionnaires and observations conducted at regular intervals to measure the learning activities of an individual on a particular subject and more innovative and objective methods, such as socio-metric badges and social network analysis. A recommendation for future research is to investigate whether the use of a full range of methods is an effective tool to capture teachers' informal learning. One point of interest could be to examine whether quantitative data collection indeed has to be done before the qualitative data collection or that

a different order is also appropriate. Another point of interest is to determine where the best cost-benefit ratio can be found among the multitude of possible measurement methods.

5. References

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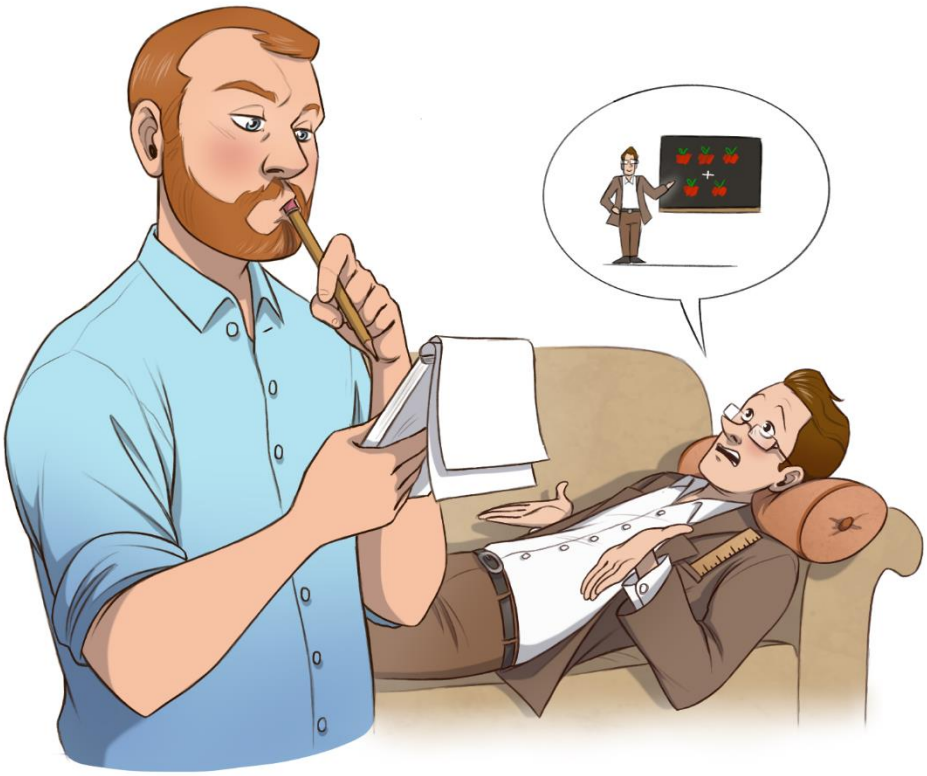
Chapter 3

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



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 deliberatively 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.

Référence

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

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 learning.

In recent decennia, workplace learning has attracted increasing interest as a means of improving teachers' professional development (Lecat et al., 2018). Workplace learning can be 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 et al., (2015) and Clough, Jones, McAndrew and Scanlon (2008) distinguish two forms of informal learning activities: social and individual informal learning. In addition, Noe, Tews and Marand (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 et al., 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's (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, 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 and colleagues (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, Milis and Sawchuk (2003), informal workplace learning can extend beyond paid work and prescribed work tasks. Bear et al. (2008) and Noe et al. (2013) argue that seventy-five percent of all that workers learn in organizations is learned through informal learning.

Based on Kyndt and Beausaert's work (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, 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, Tews, & Marand, 2013). The terms often used to draw a distinction between the two clear 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 & Woolf, 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 and colleagues (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 and colleagues (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 and colleagues (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 and colleagues (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 minutes and were audio-recorded and transcribed verbatim in order to facilitate encoding and the processing of interpretations. First, participants were provided with an introduction explaining the study and its ethical considerations. Then they signed a consent form. Secondly, 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 (2013). In cases of

doubt, the authors of this study discussed which coding would be appropriate (Larkin et al., 2006; Smith, 2004). An example of coding is provided in Table 6.

Table 6. 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)*

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, Tews and Marand (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 7 shows an overview of the frequencies of all the informal learning activities.

Table 7. 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

Even though the body of literature on teacher learning increased over the past few years, the existing research and theory on teacher learning has been dealing with a lack of clarity surrounding the concept informal learning (Clarke, 2005; Hoekstra et al., 2007; Schugurensky, 2015). Informal learning is still often viewed by existing literature as a global category containing what does not refer to formal learning or is globally mistaken for workplace learning. Consequently, literature to date has been unsuccessful to construct a comprehensive definition for teachers' informal learning.

5.1. What kind of informal learning activities teachers undertake?

5.1.1. 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.

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)*

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)

5.1.2. 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 realize 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)

5.1.3. 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 teacher 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)

5.2. 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, 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)

5.3. The role of educational level and location and time

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.

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.

6. 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, 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, Tews and Marand (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 and colleagues (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.

6.1. 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. Bellotti, 2014; 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.

6.2. 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.

7. References

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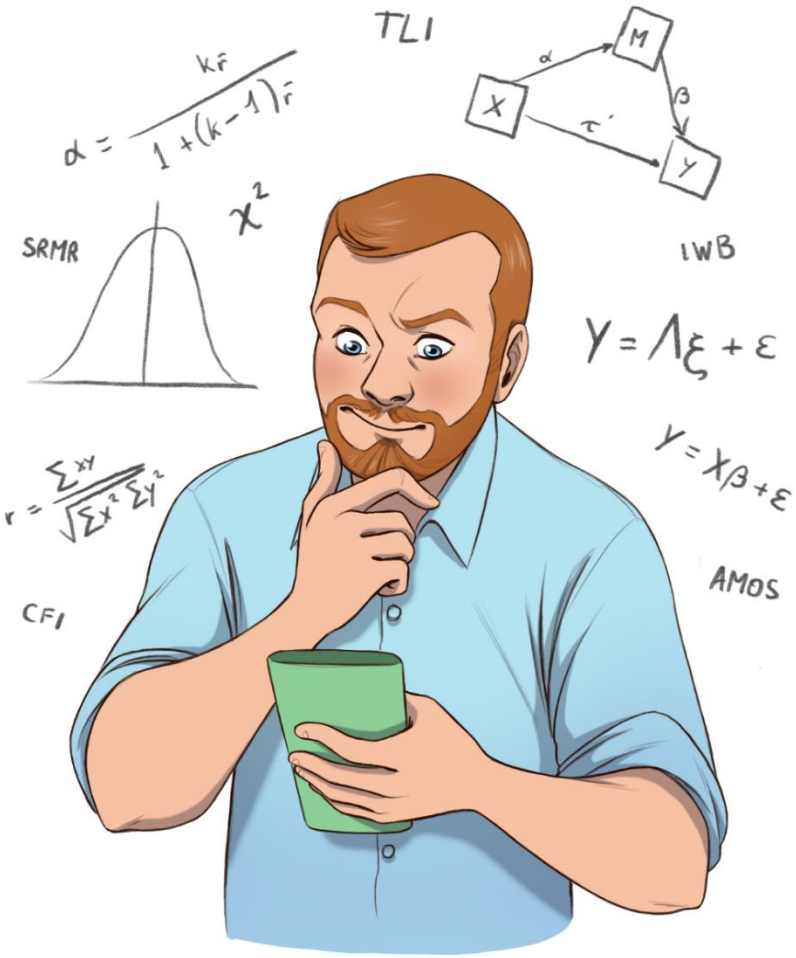
Chapter 4

On the relation between teachers' (in)formal learning and innovative working behavior: the mediating role of employability



Abstract

Teachers' innovative work behavior and professional development is receiving more attention lately. More precisely, it is argued that teachers' formal and informal learning is crucial to anticipate and deal with continuous changes and innovations in technology and didactics, for example. Therefore, this study researches the teachers' innovative work behavior by studying relations between (in)formal learning activities, employability (i.e. five competences: occupational expertise, anticipation and optimization, personal flexibility, corporate sense and balance) and innovative work behavior (IWB, i.e. ideas generation, promotion and realization). Furthermore, the mediating role of employability between learning and innovative work behavior is studied, too. Based on path analysis conducted on questionnaire data from 301 primary and secondary school teachers from the French-speaking community of Belgium, findings conclude that employability competences are related to both formal and informal learning, but the relationship between informal learning and employability is stronger. Next, making a distinction between the frequency and use of social informal learning is relevant given the differentiated role the different components play. Feedback use in particular seems to play an important role in teachers' employability and IWB. Finally, it can be concluded that employability partially mediates the relation between the undertaking of (in)formal learning activities and dimensions of innovative work behavior. Results imply that schools should pay more attention to supporting teachers' informal learning since it's crucial for improving their ability to innovate and to be able to deal with changes in the dynamic world of education.

Référence

Lecat, A., Beausaert, S., & Raemdonck, I. (2018). On the relation between teachers' (In)formal learning and innovative working behavior: the mediating role of employability. *Vocations and Learning, 11*(3), 529–554. doi: 10.1007/s12186-018-9199-x

On the relation between teachers' (in)formal learning and innovative working behavior:
the mediating role of employability

1. Introduction

Innovation in technologies and in didactics are common in the world of education today. However, do our teachers have the required abilities to keep up with those changes within their field (e.g. flipped classroom, mobile and online learning, adaptive learning technologies, differentiation in the classroom)? To this question, the answer from Dirk van Damme (2014) and Sonia Guerriero (2017) of the Centre for Educational Research and Innovation (CERI) of the OECD is clear: European teachers lack the expertise and flexibility needed to tackle innovation challenges. In other words, they are not sufficiently employable, and don't score high enough on innovative work behavior (IWB). Employability refers to: "the continuously fulfilling, acquiring or creating work through the optimal use of competences" (Van der Heijde & Van der Heijden, 2006, p. 453). Schools are dynamic by nature, so therefore it is of utmost importance to invest in their human capital. Keeping this in mind, we need to strategically support teachers' continuous professional development.

Teachers develop skills by undertaking both formal and informal learning. Formal learning takes place in a more structured, classroom-like, educational setting, while informal learning does not require a specific place or even a teacher or a trainer. Informal learning is not planned and can occur in the workplace while working (Marsick & Watkins, 2001). In line with previous studies, we make a distinction between two different forms of informal learning: social and individual (Clough, Jones, McAndrew, & Scanlon, 2008; Froehlich et al., 2015; Noe, Tews, & Marand, 2013). Moreover, Noe and colleagues (2013) distinguished learning activities using the following classifications: learning from oneself, learning from others and learning from non-interpersonal sources (such as books or internet). Learning from oneself is learning by experimenting, by trial-and-error or by reflecting on how to improve one's performance. Learning from non-interpersonal sources is learning by seeking information and resources on the internet or in literature. Learning from others refers to learning during collaboration, from colleagues.

In this study, we focus on teachers' innovation work behaviors and main determinants that explain its variance, namely employability competences, formal learning activities and social informal learning. This is in line with previous research in the field of Human Resource Development where it was shown that employees develop employability competences

through social informal learning (e.g. Froehlich et al., 2014) and employability competences can improve innovative work behaviors. Froehlich and colleagues (2014) studied the relation between social informal learning and employability. It was found that learning from others allows employees to learn about a job-related subject (occupational expertise), trends in the job-related field (anticipation/optimization) and how to react to it (flexibility) or even about organization processes (corporate sense). Also, according to Froehlich, Beausaert and Segers (2015) social informal learning in organizations, called, is more strongly related to employability than formal learning. Next, Grant and Ashford (2008) reported that an employee who improves his/her flexibility becomes more autonomous and can more easily bring innovations at work. However, to our knowledge, research on the relation between teachers' informal learning, employability and IWB has been scarce so far, especially studies on the relationship between employability competences and IWB are lacking. Additionally, the majority of previous studies were performed in higher education (e.g. Van der Heijden, Boon, van der Klink, & Meijs, 2009; van der Rijt, Van den Bosssche, van de Wiel, Segers, & Gijselaers, 2012). This study aims at filling this gap by examining the relation between teachers' formal and informal learning and employability and IWB, in primary and secondary education. Both the relation between (in)formal learning and IWB is studied, as well as the mediating role of employability, in the relation between (in)formal learning and IWB.

In that sense, the present study is innovative in three ways. First, it applies the employability framework to teachers working in primary and secondary education. Employability competences are mostly examined in employees working in business and industry while the concept of employability is relevant in other sectors, such as the educational sector, as well. Second, the study takes into account all five employability competences that have been distinguished by Van der Heijde and Van der Heijden in 2006 (occupational expertise, personal flexibility, anticipation/optimization as well as balance and corporate sense). In previous studies the focus was often on occupational expertise, personal flexibility and anticipation/optimization only (Froehlich, Beausaert, Segers, & Gerken, 2014; Gerken, 2016). This allows us to have an overall view of teachers' employability competences. Third, it is, to our knowledge one of the first studies that links employability competences to IWB.

2. Theoretical framework

2.1. Innovative Work Behavior

Innovative work behavior (IWB) refers to the voluntary introduction of new and useful ways of doing things within a role, a group or an organization (West & Farr, 1990). Employees' IWB are crucial for continuous improvement of work (Fuller, Marler, & Hester, 2006). In the context of education, and especially in schools, innovations are processes that usefully encourage the outcome and the quality of learning (Messmann & Mulder, 2011). Scott and Bruce (1994) and afterwards Janssen (2000, 2003) conceptualized IWB as a set of three idea-related behavioral tasks: idea generation, promotion and realization. Idea

generation is the production of a new idea, useful for the organization (Amabile, Conti, Coon, Lazenby, & Herron, 1996). It is also a new solution for a recent or recurrent problem (Scott & Bruce, 1994). Idea promotion refers to the exchange of these ideas or solutions (Scott & Bruce, 1994). Finally, idea realization is when these ideas are implemented in the organization. For Messmann and Mulder (2011), teachers' IWB are behaviors such as observing and listening to ideas, adapting them, developing a strategy, evaluating the strategy and finding support and adjusting evaluation.

Following this pattern, an idea is consecutively emitted, shared with potential helpers and put into practice, even though the different phases can coexist simultaneously for different ideas. When confronted with change, IWB will help to efficiently cope with organizational demands and to feel in control of that change's implementation (Bunce & West, 1994; West, 1989). Therefore, engaging in IWB could help diminish potential harmful consequences of change and concerns about change (Janssen, 2000). Overall, employees' IWB seems to be efficient to face job-related demands. Also, researchers have found evidence for a relationship between the learning process of individuals and innovation processes at the organizational level (Engeström, 1999; Fenwick, 2003; Hoeve & Nieuwenhuis, 2006; Molleman & Timmerman, 2003; Van de Ven & Polley, 1992). To summarize, innovative behavior on the workplace is an intentional self-initiated behavior with three stages: idea generation, idea promotion and idea realization (Janssen, 2000, 2003; Scott & Bruce, 1994).

Teachers' innovative work behavior takes place in a rapidly changing field. Like other professions, teachers' role is dynamic and constantly evolving (Révai & Guerriero, 2017). New demands and requirements from policymakers (or sometimes from students) may necessitate teachers to innovate and set up new ideas and practices. Some authors argue that the teaching profession has not kept up with the pace of the changing environment, including new pedagogical and learning research (e.g. Dumont, Istance, & Benavides, 2010).

2.2. Employability

Employability is defined as: "*the continuously fulfilling, acquiring or creating work through the optimal use of competences*" (Van der Heijde & Van der Heijden, 2006, p. 453). Moreover, Van Der Heijde and Van der Heijden introduce a competence-based conceptualization of employability. The importance of broader competence package has been clearly demonstrated by strategic Human Resource Management (Capelli & Crocker-Hefter, 1996; Miles & Snow, 1996; Wright & Snell, 1998). Specifically, evidence shows increasement of the importance of adaptive and social competences alongside domain-related knowledge and skills in jobs (Rodriguez, Patel, Bright, Gregory, & Gowing, 2002). More specifically, it concerns a combination of domain-specific occupational expertise, completed by four more competences: anticipation/optimization, personal flexibility, corporate sense, and balance (Van der Heijde & Van der Heijden, 2006).

Occupational expertise constitutes a substantial element of employability (Boudreau, Boswell, & Judge, 2001). It is both a prerequisite for positive workers' career outcomes and a significant human capital factor for the vitality of organizations. Furthermore, many authors

have shown that, due to fast-evolving knowledge, its importance is increasing (Schein, 1996; Van der Heijde & Van der Heijden, 2006). Continuously developing your occupational expertise might be pivotal for mobilizing innovative practices (Carmeli, Meitar, & Weisberg, 2006).

People who work for a longer period in their current job are more likely to develop skills that are relevant and specific to the domain, and thereby solve problems in a more focused and relevant way.

The second and third competences, respectively anticipation/optimization and personal flexibility refer to adaptation to changes and developments at different levels (e.g. job-level, career-level…) necessary for high-quality performance outcomes. Kluytmans and Ott (1999) described "a willingness and a possibility to adapt to changes in terms of employment, job contents, conditions, or locations" (p. 263) as an important component of employability. Examples of such influential work-related changes include, but are not limited to, higher and more complex job demands as expected to help students reach their full potential, reorganization and unemployment. The first competence refers to a self-initiating proactive variant of adaptation, whereas the second is more passive, reactive. Both competences exist in contiguity and are a prerequisite for innovative thinking and acting (Grant & Ashford, 2008).

More concretely, anticipation/optimization concerns personally and creatively preparing for future work changes to strive for the best job and career outcomes rather than entailing adaptation in its basic form (Bhaerman & Spill, 1988; North, Mallabar, & Desrochers, 1988). Complexity of work and teachers' difficulty to forecast work content leads to employees enacting more and more their jobs and professional life themselves (Weick, 1996). In that sense, Fugate, Kinichi and Ashforth (2004) claimed that "person-centered active adaptation and proactivity conceptually underpin the construct of employability" (p. 16).

Personal flexibility does not coincide with flexibility at the content level of a job. This concept refers to the capacity for smooth transitions between teaching jobs or schools, but it also encompasses easy adaptation to changes in the school or labor market. Next to creative adaptability, teachers must adapt passively to unwanted changes among their work and labor market environment. Merges and reorganizations are examples of the multiple changes occurring in schools and their environments, calling for personal flexibility at all levels. Furthermore, these changes largely call upon people's resilience. Disappointments emerging from such changes require teachers being able to cope with and recover rapidly from them. Other researchers have deemed this competence as an important part of employability and labeled it adaptability (e.g., Boudreau, Boswell, & Judge, 2001; Fugate et al., 2004). Highly flexible teachers will gain greater benefit and show further career development. They also get a better understanding of how to take advantage of those changes and embrace them (Van der Heijde & Van der Heijden, 2005).

Chapman and Martin (1995) showed that erosion of the traditional dichotomy between principals and teachers leads professionals to participate as a team member, to identify with corporate goals and to accept collective responsibility in the decision-making process. This

brings us to our fourth competence: corporate sense. Corporate sense extends the school citizenship behavior concept to participation and performance in different workgroups (for example: year of study, school or working teams on the same school subject) (Podsakoff, MacKenzie, Paine, & Bachrach, 2000). Several authors have shown a tremendous increase of the number of groups in which teachers belong to in the recent decades (Frese, 2000; Seibert, Kraimer, & Liden, 2001). Apart from collaborations at school, employees can be part of numerous networks (project network, occupational network…). Corporate sense builds on social capital inherent to social networks (Mayer & Salovey, 1997; Nahapiet & Ghoshal, 1998). Corporate sense includes, for example, sharing responsibilities, credits, failures, and experiences. In organizational literature it is demonstrated that corporate sense is necessary for generation, promotion and successful implementation of innovations (Stoffers, 2014).

Finally, the fifth and last competence of employability is labeled balance. The balance is the capacity to make compromises between opposing school' and teachers' interests. Employability cannot be considered without an honest bilateral relationship between the two, where both parties' investments and profits are balanced (Van Dam & Thierry, 2000). Work demands can compete strongly and therefore be hard to balance. Taking the organizational perspective, the development of employees' employability skills can be supported on the one hand by strategic personnel management and on the other hand by giving self-reliance and self-governance to employees. However, it seems difficult to ask teachers to be fully involved in their jobs and balance their personal interests autonomously at the same time.

The competence-based definition of employability, introduced above, entails different relationships with innovative work behavior. Occupational expertise is claimed to be helpful to mobilize innovative practices (Carmeli, Meitar, & Weisberg, 2006). Flexibility and anticipation/optimization are stated to be prerequisites for innovative thinking and acting, by envisioning, selecting and modifying situations to create outcomes (Grant & Ashford, 2008). Corporate sense, measured by employee participation and ability to work together with others, is argued to be necessary for all three dimensions of IWB, by the capacity to create, introduce and share new services and ideas (Delaney & Huselid, 1996). Stoffers (2014) found significant relationships between employability and IWB in various models using structural equation modeling analysis. Given the competence-based definition of employability implicitly relating to IWB and the previous researches of Stoffers and colleagues (2014), it is hypothesized that:

H1: Especially occupational expertise, anticipation/optimization, flexibility and corporate sense positively affects teachers' IWB.

2.3. Formal and informal learning

The professional development of teachers is studied in a multitude of ways, including workplace learning (Avalos, 2001). Workplace learning can be defined as "*the multiple ways through which employees learn in organizations*" (Jacobs & Park, 2009, p. 134). These multiple ways of learning are often labeled as formal and informal learning (Eraut, 2000). Formal learning takes place in a more structured, classroom-like, educational setting (Marsick & Watkins, 2001). It's defined as a standard paradigm of learning close to the traditional pedagogical framework of education using interaction (Hager, 2004). Generally sponsored or endorsed by the institution, formal learning is formed by planned activities aimed at giving the employees support in acquiring skills and knowledge relevant to their job. Indeed, formal learning was usually the only learning recognized by organizations (Richter, Kunter, Klusmann, Lüdtke, & Baumert, 2011). Hence, almost all training and development programs offered by an institution fall into this category. Formal learning takes place in a particular context, with a teacher, it's implicitly conceived that learning occurs in a setting apart from work. It's planned and systematic, leading purposely to the desired knowledge, behavior or certificate (Eraut, 2004).

Informal learning is learner-initiated, depending on the learner's needs and fueled by motivation to develop, but also by its involvement of action and reflection and by the less formal, non-classroom-like setting in which it occurs (Tannenbaum, Beard, McNall, & Salas, 2010). According to Bear and colleagues (2008), informal learning accounts for up to seventy-five percent of learning in organizations. It allows to overcome some limitations of formal learning programs by providing opportunities for high fidelity practice and learner interactions. This form of learning is important for both parties: it helps schools - thanks to teachers' continuous updates - regarding their knowledge and skills, to ease adaptations to changing situations and new technologies, as well as it provides higher quality of education (Thurlings, Evers, & Vermeulen, 2015). It also helps teachers to cope with current demands of personal initiatives leading to skills beyond the school offers in one's career (Sammons, Day, Kington, Gu, Stobart, & Smees, 2007).

Eraut (2004) makes a distinction between different types of informal learning: implicit, reactive and deliberative learning. Implicit learning refers to "the acquisition of knowledge independently of conscious attempts to learn and in the absence of explicit knowledge about what was learned" (Reber, 1993, p. 23). Reactive learning can be described as near-spontaneous intentional learning, in the middle of the action, as a reaction to an experience. Finally, deliberative learning defines engagement in deliberative activities targeting new knowledge acquisition or problem solving.

Furthermore, a distinction is made between individual and social informal learning (Clough, Jones, McAndrew, & Scanlon, 2008; Kwakman, 2003; Froehlich et al., 2015; Noe, Tews, & Marand, 2013). More concretely, Froehlich, Beausaert and Segers (2015) concretized social informal learning as information, help and feedback exchange with colleagues. Feedback seeking is defined by Ashford and Cummings (1983, p. 466) as a "*conscious devotion of effort toward determining the correctness and adequacy of behaviors*

for attaining valued end states". When seeking for feedback individuals can adapt two different strategies (Anseel & Lievens, 2006; Ashford, 1986): First, by observing situations and how others respond to their behavior. Second, by directly asking others how they proceed. It's a powerful and efficient method to learn in a job (Bamberger, 2009). Next, help seeking refers to an adaptative strategy for coping with job difficulties or problems by asking for help (Butler, 2007). Finally, relevant information seeking is about asking others for work-related information, not linked to personal practice (Bamberger, 2009). It's argued that social informal learning behaviors can improve job performance, especially in knowledge intensive organizations (e.g. Rosette, Mueller, & Lebel, 2015).

2.3.1. Learning and employability

Concerning the relation between formal learning and employability, Sanders and De Grip (2004) showed a positive relationship between participation in formal learning courses and employability among low-skilled workers, especially for switching jobs within the company or for a better match with the job. Finally, Van der Heijden and colleagues (2009) were using regression models and found a positive relationship between the number of days attending job-related formal training and three competences of employability, namely expertise, anticipation/optimization and corporate sense. Froehlich, Beausaert, Segers and Gerken (2014) also showed that formal learning activities in the workplace increase employability, i.e. anticipation and optimization, using structural equation modeling.

Concerning the relation between informal learning and employability, just like with formal learning, Van der Heijden and colleagues (2009) found a positive relationship when conducting regression analyses. Informal learning was measured in terms of networking inside the university and related to four of the employability competences, namely expertise, flexibility, corporate sense and balance. Moreover, having a broad network outside the university is positively related to anticipation/optimization. Arocena, Nunez and Villanueva (2006), found that social informal learning has a significant positive correlation with flexibility by strengthening teachers' ability to deal with personal and organizational changes and transitions, with all the associated benefits for the teachers and the schools. Also, Froehlich and colleagues (2014) found in a quantitative cross-sectional survey using SEM a positive relationship between social informal learning (i.e. feedback, help and information seeking) and workers' employability in three Dutch and Austrian organizations.

Several studies point out that informal learning is an effective tool to support professional development (Eraut, 2004; Lohman, 2005; Schulz & Roßnagel, 2010). Likewise, most learning in organizations does not occur in formalized learning programs (Flynn, Eddy, & Tannenbaum, 2006; Tannenbaum, 1997). Two of the research studies mentioned above, but conducted in settings outside education indicate that informal learning has a bigger impact on employability compared to formal learning (Froehlich et al., 2014; Van der Heijden et al., 2009).

Given these previous research results, e.g. Froehlich et al (2014) finding larger β for social informal learning than for formal learning, it is hypothesized that informal learning plays a more important role in developing employability competences than formal learning.

H2: Both formal and informal learning activities positively affects employability.

H3: Informal learning has a stronger relationship with employability than formal learning.

2.3.2. Learning and IWB

According to previous research, learning is a main driver for innovative work behavior (Keskin, 2006; Messmann & Mulder, 2012). Workers need to acquire and propagate new knowledge to generate and implement news ideas (Calantone, Cavusgil, & Zhao, 2002; Janssen & Van Yperen, 2004). Amabile, and colleagues (1996) explained this by the fact that learning provides a basis for workers' innovations by boosting creativity-relevant skills and knowledge in the occupational domain. In that sense, Tynjälä (2008) found a positive relationship between employees' learning network and innovative activities. Her study showed that employees get space, time and new ideas to innovate and develop practices through network meeting. Hirst, Van Knippenberg and Zhou (2009) showed that individual learning boost available knowledge and then positively influence creativity and innovation. More concretely, concerning social informal learning, research showed that feedback seeking fosters innovative work behavior, by increasing ideas generation and implementation (Noefer, Stegmaier, Molter, & Sonntag, 2009). Research in the educational sector showed that social informal learning and collaboration help teachers to develop and implement innovations (Messmann & Mulder, 2011; Mohammad & Harlech-Jones, 2008; Schussler, Poole, Whitlock, & Evertson, 2007). Finally, Gerken (2016) found significant positive relationship between feedback and information seeking and all dimensions of IWB. The role of help seeking was not tested due to bad internal consistency of the scale. In conclusion, learning is essential for teachers to show innovative work behavior, especially social informal learning.

H4: Both formal and informal learning activities positively affects IWB.

H5: Informal learning has a stronger relationship with IWB than formal learning.

2.3.3. Employability as mediator

We saw previously that learning is positively related to both employability and Innovative work behavior and that employability correlates significantly positively with IWB. Grant, Parker and Collins (2009) showed that employability depends on workers' initiative for learning because they have to seek for opportunities and deal with problems. Similarly, Murdoch-Eaton and Whittle (2012) suggested that developing employability depends on major learning experiences and leads to new strategies and innovations. Gerken (2016) indicated that lifelong (in)formal learning is the best way to work on employees' employability and that employability is needed to bring innovations at work. Finally, Van Dam (2004) showed that employees who are willing to learn to improve their employability, take more initiative and undertake more employability activities. Given the research discussed above, it is hypothesized that:

H6: Employability competences, i.e. occupational expertise, anticipation/optimization, flexibility and corporate sense are mediators in the relation between formal and informal learning and innovative work behavior.

3. Method

3.1. Participants

301 teachers participated in an online survey. Opportunity sampling was used. The researchers sent requests to schools principals, directly to teachers in primary and secondary schools or via social network pages. About half of the teachers in the sample (49.5%) worked in primary schools, whereas 50.5% worked in secondary schools in the French-speaking community of Belgium. The sample consisted of 79.1% women, (85.2% in primary school and 73% in secondary school). These percentages are in line with the statistics for the French-speaking community of Belgium: 82% of the primary school teachers and 63% of the secondary school teachers are women (FWB indicators, 2015). The age of the teachers in our sample varied from 19 years to 59 years. The mean age was 37.42 years (SD = 11.38). The average number of years in the teaching profession was 14.22 (SD = 11.25). 8 teachers (2.7%) obtained a secondary school degree, 230 teachers (76.4%) had a Bachelor degree and 63 teachers had a Master degree (20.9%).

3.2. Instruments

Innovative Work Behavior. Innovative work behavior was measured with a validated questionnaire developed by Janssen (2003). The scale consists of 19 items, distributed across three subscales: idea generation, idea promotion and idea realization (Janssen, 2000). Every item was scored on a 6-point Likert scale ranging from 'totally disagree' to 'totally agree'. Idea generation was assessed with 4 items. An example item is: "Creating new ideas for difficult issues". Idea promotion was assessed with 7 items. An example item is: "Mobilizing support for innovative ideas". Finally, idea realization had 8 items. An example item is: "Transforming innovative ideas into useful applications". Cronbach's alphas for the three scales were .83 for idea generation, .92 for idea promotion and .95 for idea realization.

Although the questionnaire was previously used with teachers (Messmann, Mulder, & Gruber, 2010), the questionnaire was translated in French. Therefore, an exploratory factor analysis was conducted. The factor analysis, with maximum likelihood analysis, based on eigenvalues, confirmed the theoretical structure with three factors: idea generation, promotion and realization. Idea promotion explained 55.02 percent of the variance, idea generation 9.8 percent and idea realization 5.92 percent and each had eigenvalue greater than 1.

Employability. Employability was measured with a validated questionnaire developed by Van der Heijden, Boon, Van der Klink and Meijs (2009). Each of the five employability competences (expertise, anticipation/optimization, flexibility, corporate sense and balance) was assessed by a subscale. An example item for expertise is "I consider myself competent

to have deep and specific conversations in my work area". An example item for anticipation/optimization is "I value the implementation of newly acquired skills and knowledge". An example item for personal flexibility is "I have a good ability to adapt to change in my workplace". An example item for corporate sense is "I share the values, vision and goals of my school". Finally, an example item for balance is "I balanced the time spent in achieving my own career goals and supporting my colleagues". Every item was scored on a 5-point Likert scale ranging from 'not agree at all' to 'totally agree'. Exploratory factor analyses confirmed the five-factor structure. Flexibility explain 20.52 percent of the variance, balance, 11.08 percent, anticipation/optimization explain 7.71 percent, corporate sense 6.44 percent and occupational expertise 4.5 percent. Each dimension had eigenvalue greater than 1 Cronbach's alphas for the five scales were .66, .80, .75, .77 and .81, respectively.

Formal learning. Formal learning was assessed by questioning participation in formal learning activities during the previous school year. More specifically, five different questions asked about the time spent in conferences, seminars, courses and training. An example item is: "How long (in hours) did you spend last school year in formal learning activities, such as conferences?" For each item, the teacher indicated if s/he participated in the activity or not. Total score for this variable is calculated by taking the sum of the items. Scores ranged from 0 to 5.

Informal learning. We used an adapted questionnaire developed by Froehlich, Beausaert and Segers (2015) regarding respectively feedback, help and information seeking. The questionnaire consisted of 30 questions in total. 15 questions measured the frequency of informal learning (rate of occurrence). Each subscale (frequency of feedback seeking, information seeking and help seeking) was measured with five questions, on a 5-point Likert scale ranging from 'almost never' to 'very often'. An example item is: "I asked my colleagues to evaluate my work". The other 15 questions measured the use of what is informally learned (the application for a purpose), again five questions per subscale (use of feedback seeking, information seeking and help seeking) were scored on a 5-point Likert scale ranging from 'not agree at all' to 'totally agree'. An example item is: "I used the received feedback for my professional development".

Exploratory factor analysis (maximum likelihood), based on eigenvalue, confirms the six factors structure. Use of feedback explains 23.87 percent of the variance, help 7.08 percent and information 5.33 percent. For the other dimension, frequency of feedback seeking explains 3.75 percent of the variance, frequency of information seeking explains 8.38 percent and frequency of help seeking explains 2.88 percent. Each had eigenvalue greater than 1. Cronbach's alphas for the frequency scales were .78 for feedback seeking, .62 for help seeking and .76 for information seeking. For the usage scale, Cronbach's alphas were .80 for feedback seeking, .79 for help seeking and .68 for information seeking.

Demographics. To control for background information, participants were asked to fill out several questions on their demographics: gender, highest degree, age and the educational level in which they taught (either primary or secondary school).

3.3. Procedure

Data collection was done by taking online questionnaire (Qualtrics). Participants received brief information on the general aim of the study and then completed the questionnaire. Completion took around 20 minutes. Questions were presented in a fixed order: demographics, formal learning, informal learning, employability and IWB. At the end of the questionnaire, participants had the opportunity to indicate an email address if they were willing to receive information about the results. They also had the possibility to comment on the questionnaire.

3.4. Data analysis

First, normality distribution was checked for all employability, IWB and learning variables (all Skewness and Kurtosis indices were between -2 and 2). Second, preliminary analyses were calculated (means, standard deviations and correlations) for all variables under study. Third, linear regression analyses were done in two steps to prepare for the path model. During the first step, five linear regressions were made with all learning activities as independent variables and employability competences as dependent variables. One regression was made for each employability competence. For the second step, three regression were conducted with employability competences as independent variables and IWB as dependent variables. One regression was made for each independent variable. Fourth, a path model was constructed, only considering significant relations found in the regression analyses. The path model was built in AMOS, version 16.0. Path analysis is a statistical methodology using multiple regression analysis and is employed to determine whether a set of data fits well with a particular causal model (Pedhazur, 1982). A hypothesized model of relations between our variables is statistically tested to determine the degree of consistency with the data. This is referred to as the goodness of fit. An adequate goodness of fit, established with statistical indices, supports the plausibility of the relation among the variables. For CFI indices, values greater than .90 are typically considered acceptable degree of consistency (Bollen, 1989; Byrne, 2001; Hu & Bentler, 1999). For well specified models, SRMR indices of .08 or less is an indication of a relatively good fit between observed data and model (Hu & Bentler, 1999). Chi-square can be used to test the null hypothesis that the

reduced model fits the data as well as does a full, well identified model. In such a model, Chi-square will be equal to zero, since the fit will be perfect. Deleting a (non-zero) path will reduce the fit of the model to data and will increase the value of Chi-Square. This can lead to a less complex model that will give a better explanation of covariances (Hu & Bentler, 1999).

4. Results

4.1. Preliminary analysis

Table 8 shows means, standard deviations and correlations for the variables under study. Concerning employability and learning, occupational expertise significantly positively correlated with one subdimension of informal learning: use of information. Furthermore,

anticipation/optimization and flexibility significantly positively correlated with all subdimensions of informal learning, except for use of help and with formal learning activities. Corporate sense significantly positively correlated with all subdimensions of informal learning but not with formal learning activities. Finally, balance correlated significantly positively with social informal learning dimensions: use of feedback, frequency of help seeking and use of help. All employability dimensions significantly positively correlated with all dimensions of IWB, except for balance and idea generation.

Table 8. Correlations between Variables under Study

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Formal learning	2.20	1.12															
2 Informal learning - Feedback seeking (Freq.)	2.89	.76	.138*	1													
3 Informal learning - Feedback seeking (Use)	3.86	.75	.187**	.404**	1												
4 Informal learning - Help seeking (Freq.)	3.64	.63	.145*	.306**	.369**	1											
5 Informal learning - Help seeking (Use)	3.97	.83	.07	.324**	.545**	.480**	1										
6 Informal learning - Information seeking (Freq.)	3.33	.77	.109	.557**	.466**	.575**	.467**	1									
7 Informal learning - Information seeking (Use)	4.12	.59	.044	.206**	.361**	.117*	.255**	.153*	1								
8 Occupational expertise	3.86	.59	.081	.049	.112	-.007	-.049	-.056	.141*	1							
9 Anticipation and optimization	3.82	.81	.218**	.229**	.294**	.126*	.012	.186**	.378**	.311**	1						
10Flexibility	3.84	.77	.157**	.191*	.296**	.119*	.107	.221**	.265**	.265**	.436**	1					
11Corporate sense	4.04	.74	.033	.249**	.249**	.257**	.291**	.292**	.222**	.031	.213**	.292**	1				
12Balance	2.92	.99	.058	-.094	.147*	.141*	.153**	.074	.002	.145*	.038	.119*	.156**	1			
13IWB - Idea generation	3.87	1.14	.179**	.116*	.088	-.045	-.090	.018	.246**	.260**	.442**	.358**	.241**	-.011	1		
14IWB – Idea promotion	4.14	1.09	.108	.280**	.238**	.213**	.114*	.242**	.302**	.162**	.368**	.271**	.513**	.157**	.462**	1	
15IWB – Idea realization	4.09	1.1	.104	.267**	.283**	.106	.100	.190**	.341**	.252**	.457**	.358**	.366**	.131*	.505**	.806**	1

Notes: *p<.05 ; **p<.01

Concerning IWB and learning, idea promotion significantly positively correlated with all subdimensions of informal learning and idea realization significantly positively correlated with feedback and information seeking (frequency and use) but not with help seeking. Next, idea generation correlated with formal learning activities.

4.2. Regression analyses

Findings show that formal learning activities are significantly related to only one employability competence: anticipation, as well as one IWB dimension: idea generation.

Feedback and information use are correlated each with four of the five employability competences. Feedback use significantly predict occupational expertise, anticipation/optimization, flexibility and balance scores. Information use significantly

predict occupational expertise, anticipation/optimization, flexibility and corporate sense. These two informal learning dimensions have good betas and are strong predictors of employability competences.

Feedback use and information use dimensions are correlated positively with anticipation/optimization and help use negatively. Formal learning and information frequency also positively predict anticipation/optimization. Learning formally, seeking information and using social informal learning might therefore allow teachers to be better prepared for future changes while teachers using help from others might be less prepared. The model explained 26.1% of anticipation/optimization variance.

A negative beta is observed for feedback frequency in the predicting model of balance. Asking frequent feedback leads to less balance between organizational and personal interests as to much feedback from others might influence teachers to prioritize organizational goals at the risk of personal goals. Moreover, feedback frequency and information use are both positively linked to idea promotion and idea realization. It is therefore suggested that asking frequent feedback and mobilizing the information collected are beneficial for exchange and implementation of ideas and solutions.

Table 9. Regressions Analyses of Employability Competences and IWB Dimensions

	Expertise		Anticipation		Flexibility		Corporate sense		Balance		Idea generation		Idea promotion		Idea realization	
	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2
Formal learning	.045		.142*		.093		-.035		.010		.107*		.029		-.010	
Feedback frequency	.051		.033		.008		.090		-.203**		.059		.136*		.136*	
Help frequency	-.144		-.069		.028		-.037		-.172*		.002		.021		-.021	
Information frequency	-.054		.153*		.092		.180*		.216**		-.133		.015		-.031	
Feedback use	.174*		.218**		.212**		.109		.225**		-.061		-.003		.064	
Help use	-.077		-.205***		-.101		.097		.075		-.099		-.099		-.064	
Information use	.173*		.355***		.198**		.121*		-.066		.097		.155**		.170**	
		.066		.261		.130		.117		.074						
Occupational expertise											.098		.045		.080	
Anticipation/optimization											.270***		.169**		.239***	
Flexibility											.164**		-.016		.086	
Corporate sense											.181**		.418***		.223***	
Balance											-.044		.104*		.081	
												.279		.356		.330

Notes: The reported regression coefficients are standardized coefficients. *p < .05, **p < .01, ***p < .001

Finally, the employability competences anticipation/optimization and corporate sense significantly and positively predict all IWB dimensions. Explained variances are 27.9 percent for idea generation, 35.6 percent for idea promotion and 33 percent for idea realization.

4.3. Path model

The original model is based on significant relations found on basis of regression analyses (Table 9). Covariances between errors terms were added to slightly improve the model based on Chang, Hsu, Liou and Tsai (2013) suggestion. The fit indices indicated that the fit of the hypothesized model is reasonable ($\chi^2/df = 2.21$, SRMR = .06, RMSEA = .06, TLI = .91 and CFI = .96).

Table 10. Path Estimates of the Structural Equation Model

From		To	β	SE	*p*
Feedback use	→	Expertise	.060	.043	.160
Information use	→	Expertise	.177	.054	.001
Formal learning activities	→	Anticipation/optimization	.086	.033	.009
Feedback use	→	Anticipation/optimization	.194	.058	< .001
Help use	→	Anticipation/optimization	-.159	.046	< .001
Information use	→	Anticipation/optimization	.453	.067	< .001
Information frequency	→	Anticipation/optimization	.129	.058	.026
Feedback use	→	Flexibility	.208	.052	< .001
Information use	→	Flexibility	.239	.069	< .001
Information frequency	→	Corporate sense	.251	.053	< .001
Information use	→	Corporate sense	.207	.063	< .001
Feedback frequency	→	Balance	-.249	.075	< .001
Feedback use	→	Balance	.240	.077	.002
Help frequency	→	Balance	-.164	.090	.070
Information frequency	→	Balance	.339	.103	.001
Formal learning activities	→	Idea generation	.074	.048	.121
Anticipation/optimization	→	Idea generation	.474	.079	< .001
Flexibility	→	Idea generation	.214	.078	.006
Corporate sense	→	Idea generation	.193	.081	.017
Feedback frequency	→	Idea promotion	.161	.055	.004
Information use	→	Idea promotion	.190	.082	.021
Anticipation/optimization	→	Idea promotion	.286	.070	< .001
Corporate sense	→	Idea promotion	.608	.071	< .001
Balance	→	Idea promotion	.043	.035	.217
Feedback frequency	→	Idea realization	.151	.057	.009
Information use	→	Idea realization	.273	.086	.001
Anticipation/optimization	→	Idea realization	.439	.073	< .001
Corporate sense	→	Idea realization	.360	.074	< .001

Three paths (feedback use – expertise, formal learning activities – idea generation and balance – idea promotion) were deleted because they were not significant (Table 10).

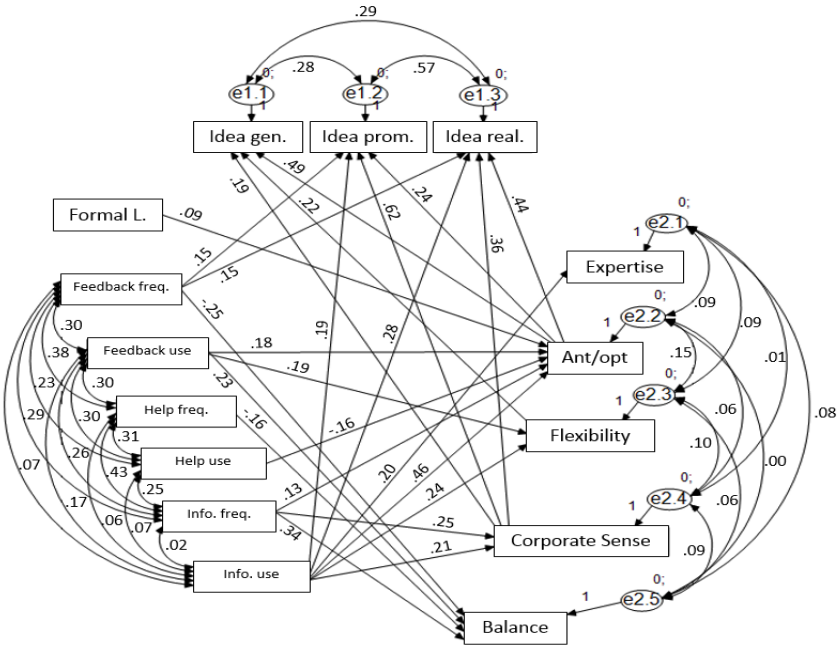


Figure 5. Final Path Model

The fit indices for the final model were: $\chi^2/df = 2.19$, RMSEA = .06, SRMR = .06, TLI = .91 and CFI = .96 (Figure 5). The percentage of the response variable variation explained by the model is 4.8 for expertise, 24.1 for anticipation/optimization, 11.3 for flexibility, 9.9 for corporate sense and 8.3 for balance. IWB dimensions percentage of variance are 22.7 for idea generation, 34.8 for idea promotion and 31.2 for idea realization.

4.3.1. On the relation between employability and IWB

We found that anticipation/optimization, flexibility and corporate sense play a role in IWB's idea generation. Anticipation/optimization and corporate sense also play a role in IWB's idea promotion. Finally, anticipation/optimization, flexibility and corporate sense play a role in IWB's idea realization. Hypothesis 1 was "*Especially occupational expertise, anticipation/optimization, flexibility and corporate sense positively affects teachers' IWB*". Results partially supports H1, because expertise does not predict the IWB dimensions and no significant beta was found for flexibility on "idea promotion".

4.3.2. On the relation between learning and employability

We found that only information use plays a role in teachers' occupational expertise. Formal learning activities, information seeking frequency and all dimensions of informal learning use play a role in the optimization and anticipation competence (but negatively for help use). Use of feedback and use of information seeking relate positively to flexibility. Only information seeking frequency and use play a role in corporate sense. Finally, frequency and use of feedback seeking, frequency of help seeking and frequency of information seeking are related to life-work balance. Hypothesis 2 was: "*Both formal and informal learning activities positively affects employability*" and hypothesis 3 was: "*Informal learning has a stronger relationship with employability than formal learning*". We can see that formal learning positively affects only one dimensions of employability (anticipation/optimization) with small but significant β. This partially supports H2. Furthermore, informal learning dimensions have higher β and explain a higher percentage of the variance in employability competences. This totally supports H3, except for the significantly negative path between help use and anticipation/optimization.

4.3.3. On the relation between learning and IWB

Learning did not play a role in IWB's idea generation. However, frequency of feedback seeking and use of information affect IWB's idea promotion and realization. Formal learning does not impact innovative work behavior which makes us to conclude that Hypothesis 4 stating that "*Both formal and informal learning activities positively affects IWB*" is not supported. Hypothesis 5 stated that "*Informal learning had a stronger relationship with IWB than formal learning*" is only partially confirmed. Two social informal learning dimensions affect IWB's idea promotion and realization positively. This don't support H4. Informal learning has significant positive β with idea promotion and idea realization. This partially supports H5.

4.3.4. On the mediating role of employability between (in)formal learning and IWB

Three full mediating effects of optimization/anticipation were found between formal learning activities and the three IWB's dimensions. When studying the mediating role of employability between informal learning and IWB, three employability competences played a mediating role.

Optimization/anticipation fully mediated ten relationships. Firstly, three between feedback use and all IWB dimensions. Secondly, three between help use and all IWB dimensions. Thirdly, three between information frequency and all IWB dimensions. Fourthly, one between information use and idea generation. It also partially mediated two relationships, firstly between information use and idea promotion, secondly between information use and idea realization.

Flexibility fully mediated two relationships, with both information use and feedback use on the one hand and idea generation on the other hand.

Corporate sense fully mediated four relationships. We found mediating effects of corporate sense between information frequency and all IWB dimension. Corporate sense also has a full mediating effect between information use and idea generation. Furthermore, corporate sense partially mediated two relationships, one between information use and idea promotion and one between information use and idea realization.

Expertise and balance did not mediate the relationship between informal learning and IWB.

Hypothesis 6 was: "*Employability competences, i.e. occupational expertise, anticipation/optimization, flexibility and corporate sense are mediators in the relation between formal and informal learning and innovative work behavior*". Path model showed some partial and full mediating effect of employability competences between (in)formal learning and IWB dimensions. This partially supports H6 for anticipation/optimization, flexibility and corporate sense.

5. Conclusion and discussion

In the dynamic world of education, teachers' professional development is of utmost importance. Teachers need to innovate and develop abilities to keep up with those changes. Teachers develop themselves professionally by undertaking both formal and informal learning. These formal and informal learning activities can increase their employability and innovative work behavior. More specifically, previous research argued that especially social informal learning strengthens teachers' ability to deal with personal and organizational changes and transitions, with all the associated benefits for the teachers and the schools (Arocena et al., 2006). Therefore, this study aimed to investigate relations between teachers learning, employability and innovative work behavior. We also examined the mediating role of employability between learning and innovative work behavior.

It was hypothesized that social informal learning is more strongly related to employability and IWB in comparison to formal learning. We also hypothesized that employability mediates the relation between learning and IWB. In other words, we argued that it is not only the teachers' formal learning (courses, conferences, etc.) that is linked to their innovative work behavior and employability, but instead we suggested that the undertaking of informal learning activities has greater effects. Thus, we investigated the relations between both formal and informal learning and employability and IWB. Findings supported the idea that formal learning activities improves teachers' anticipation and optimization. This means that formal learning activities can help teachers to be better prepared for future change within the school and the educational world. Findings also supported the idea that social informal learning improves all teachers' employability competences. Moreover, social informal learning activities have a stronger relation with IWB than the formal learning activities undertaken. Furthermore, three competences of employability, i.e. anticipation/optimization, flexibility and corporate sense increase the realization of new ideas on the workplace.

The results allow us to take three main conclusions. First, employability competences can be especially improved by diverse informal learning. Undertaking formal learning activities is only slightly linked to anticipation/optimization. This is in line with previous researches that indicated that informal learning activities increase employees' employability in profit and non-profit organizations (Froehlich, Beausaert, Segers, & Gerken, 2014). The negative relation found in our research between help use and anticipation/optimization is not supported by previous research. Froehlich and colleagues (2014) found that formal and informal learning affect anticipation and optimization both positively. It is possible that, for teachers, using someone's help might prevent them from developing the inner capacity to find answers and solutions themselves and from being prepared for future work changes. Furthermore, Froehlich et al. found a positive relation between help seeking and information seeking and expertise and personal flexibility. We only found positive relation between information use and occupational expertise, but not between other dimensions of social informal learning dimensions and occupational expertise. These different findings might come from differences within the occupational setting. Teachers may ask and use help in a different way and for other reasons then to develop their occupational expertise.

We found positive relations between feedback and information use on the one hand and flexibility on the other hand. Furthermore, the informal learning dimensions have strong relationships with all five employability competences, especially information use. It means that undertaking informal social learning activities leads towards highly developed employability competences than formal learning activities. Furthermore, social informal learning showed strong correlations with two of the three IWB dimensions while formal learning activities do not show significant paths. A possible explanation might be that formal learning offers tools to prepare for future changes but does not sufficiently encourage and trigger teachers to think outside the box. Social informal learning is fueled by learning motivation and involves personal initiative, action and reflection. Interaction with colleagues can especially help teachers to promote ideas and to find ways to implement them.

Our second main conclusion is that a distinction needs to be made between different types of social informal learning activities and their frequency and use given the differentiated impact on employability and IWB. It was found that especially information use played an important role in teachers' employability and IWB. The use of information is related to higher levels of expertise, anticipation/optimization, flexibility and corporate sense. It also influences idea generation and realization. Seeking information is therefore the most effective way for teachers to improve their employability competences and provoke innovative work behavior.

Third, it can be concluded that some employability competences mediate specific relationships between the undertaking of learning activities and innovative work behavior. These findings are in line with indications given by previous research done in others profit and non-profit organizations, even if direct evidence of employability as mediator was not reported (e.g. Gerken, 2016; Murdoch-Eaton & Whittle, 2012). For example, Gerken (2016) found a positive significant relation between formal and informal learning and employability. However, also here informal learning had a bigger impact on employees' employability. She

also found that informal learning influences employees' IWB and argued that employability might lead to more IWB however employability as a mediator was not tested.

5.1. Limitations and suggestions

The study results should be interpreted keeping three major limitations in mind. First, participants participated voluntarily in the research. In that case it is possible that they had a greater commitment to continuous development and workplace learning than their colleagues who did not participate in the study. Future research could avoid this potential selection-bias by randomly selecting teachers in randomly selected schools and trying to augment the response rate of the randomly selected teacher group. Related to that, only self-reports were taken into account. Although it is believed that the learner him/herself is in the best position to indicate how much he/she learns and how, in the future multiple raters, such as colleagues and the principal could be taken into account, for example to score teachers' employability competences and IWB. Second, our research included primary and secondary school teachers from the French-speaking community of Belgium. This allows us to generalize the research results to both primary and secondary school teachers. However, still differences exist between primary and secondary school teachers, for example what concerns their tasks, day schedules or innovations they are dealing with. Primary school teachers cover different school subjects, have in general only a class and must show different skills than secondary teachers. Secondary school teachers have a specific school subject and often change class groups. Furthermore, their students have different abilities than primary students and use diverse tools and media. In this sense teachers have different innovations to deal with. Focusing on these differences and specificities is an opportunity for future research. Finally, this research is cross-sectional and did not allow us to look at teachers' progress over time. Further researches investigating teachers' evolution can bring a lot to the field.

5.2. Practical implications

For schools, principals and teachers it is important to be aware about the important role social informal learning plays in teachers' employability competences and IWB. Given the importance of it, schools and their principals should pay more attention to supporting teachers' social informal learning. The present results showed that of the three dimensions of social informal learning concretized by Froehlich, Beausaert and Segers (2015), both use of information and use of feedback seeking are the most powerful in fostering employability competences. In line with Noefer and colleagues (2009), we found that the role of feedback and information is important for stimulating innovative work behavior and employability competences. In this way, the research of Noefer and colleagues was cross-validated in primary and secondary education. Installing a warm learning climate which allows teachers to ask for information and feedback and then dare to put into practice the feedback they received, even with the risk to make errors, could help. Supporting teachers' informal learning can also be done in the workplace (e.g. Avalos, 2001) for example by setting-up a discussion corner in the teacher staff room, where there is one single coffee machine, that brings teachers together to discuss, collaborate and share information. Also, mentoring

systems could be put in place, to make room for information, help and feedback exchange. However, increasing teachers' collaboration is not the only way to foster social informal learning (e.g. Kyndt, Gijbels, Grosemans, & Donche, 2016). The non-teaching staff or people outside the school can also be useful for social informal learning. For example, a school psychologist can give useful feedback to a teacher concerning a class situation, or a comedian friend can give valuable information on acting. Also family and friends can give ideas, feedback or advice. Finally, in order to foster informal learning in schools, inter-schools digital platforms supporting information sharing and feedback exchange could be installed.

Taking our research results into account, the kind of interventions mentioned above should create a playground for informal learning and lead toward more employability and IWB. Hirst, Van Knippenberg and Zhou (2009) found a significant positive relation between on the one hand learning boosting available knowledge and innovation on the other hand. Furthermore, our results showed that formal training should especially be stimulated if teachers need to be able to anticipate to changes or innovations. Formal learning helps teachers to better anticipate and optimize. However, while schools spend money and time on formal learning activities, it is not always the most efficient way for stimulating teachers' expertise growth, flexibility and IWB. Instead informal learning is found to be more efficient and can cost less, especially with small changes (for example, having team meeting during lunch time). It gives teachers control over their learning and allows them to effectively work on their specific learning needs.

We advise educational policy and schools to support teachers' social informal learning to improve their ability to innovate and to deal with future challenges such as the multicultural society and differentiation in the classroom.

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Chapter 5

Context matters

On the relation between school learning climate and teachers' social informal learning across working life

Abstract

This paper considers the role of learning climate for teachers' social informal learning activities. Based on a dataset of 467 primary and secondary school teachers a structural equation model was tested, including learning climate dimensions as independent variables and social informal learning dimensions as dependent variables. In a follow-up post-hoc analysis, differences in social informal learning between four teachers groups were tested on basis of their perception of the learning climate. Results showed that especially the error-avoidance and the facilitation dimensions of the school learning climate predicted the extent in which teachers make use of their social informal learning activities. Second, it can be concluded that teachers undertake less social informal learning activities (feedback, help and information seeking) when they are highly experienced in teaching. They also use less the help they received, from their colleagues when having more professional experience. Third, our findings suggest that teachers with a permanent contract undertake less social informal learning activities. This study raises schools' and principals' awareness about the role of learning climate for fostering teachers' lifelong learning. Especially the fact that teacher are allowed to make mistakes and learn from them and feel supported in their continuous learning and development, are crucial factors. The present results also showed that more experienced teachers with a permanent contract undertake less social informal learning activities (feedback, help and information seeking) and make less use of the feedback, help and information received. In that sense, this study argues that the teacher career policy of permanent contracts must be reconsidered in the light of sustainable teacher professional development.

Référence

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Context matters:
on the relation between school learning climate and teachers' social informal learning across working life

1. Introduction

In recent years, workplace learning has attracted increasing interest as a core dimension of professional development (Lecat, Beausaert, & Raemdonck, 2018). Primary and secondary school teachers' professional development has been high on the agenda of policymakers, schools and scholars in the past decades (Hoekstra & Korthagen, 2011). This resulted in more research on teachers' workplace learning, often defined as formal and informal learning (Marsick & Watkins, 2001). However, teachers indicated to learn mostly through their everyday work practice and not through formal learning (e.g. Kwakman, 2003; Lohman & Woolf, 2001). Other studies found that informal learning is effective in fostering teachers' high-quality performance, innovative work behaviour, employability competences, etc. (e.g. Lecat et al., 2018; Lohman, 2015; Messmann & Mulder, 2011). Consequently, greater attention was paid to teachers' informal learning in literature (e.g. Jurasaite-Harbison, 2008; Kyndt, Gijbels, Grosemans, & Donche, 2016; Marsick & Watkins, 1990). Although workplace learning can be both formal and informal, most of the learning activities undertaken are informal in nature (e.g. Jeon & Kim, 2012; Marsick, 2009). Informal learning is often defined as the opposite of formal learning, which is structured, planned and requires the presence of an instructor (Marsick & Watkins, 2001). Various authors characterize informal learning as self-initiated learning that encompasses learners to actively give direction to their current and future learning rather than responding passively to environmental changes (e.g. Hoekstra & Korthagen, 2011; Jacobs & Park, 2009; Lohman, 2005; Tannenbaum et al., 2010). Furthermore, a distinction is made between different types of informal learning activities. More specifically, Froehlich and colleagues (2015) and Kwakman (2003) distinguish two types of informal learning activities: social and individual informal learning. For what concerns social informal learning, Froehlich and colleagues refer to feedback, help and information seeking.

Nevertheless, teachers might differ. While one teacher learns a lot informally, another teacher does not (Hoekstra, Brekelmans, Beijaard, & Korthagen, 2009). Especially for those teachers favoring social informal learning, a supportive learning climate might play a pivotal role (e.g. Jurasaite-Harbison & Rex, 2010). School learning climate is defined as a school's effort to create a learning supporting environment in order to help teachers develop their knowledge and abilities (e.g. Marsick, Watkins, Callahan, & Volpe, 2009; Nikolova et al.,

2014; Schneider, Ehrhart, & Macey, 2013). So far, not much research studied the relation between the schools' learning climate and teachers' social informal learning. In addition, both concepts are more applied in studies on workplace learning in organisations than in research on teaching and teacher education. The present study brings these two strands of research together by applying concepts mostly used in workplace learning literature, i.e. learning climate and social informal learning, to teachers in schools. Their professional development is mostly discussed in specific literature on teaching and teacher education. Nevertheless, also schools can be seen as organisations. This study will research the relation between school learning climate and social informal learning activities of teachers. It contributes to theory by bringing together workplace learning research as well as literature on teaching and teacher education. In addition, to our knowledge, this is the first study researching the relationship between learning climate and teachers' social informal learning.

2. Teachers' social learning activities

Formal and informal learning activities are two extremes on the same continuum and therefore often defined in a related manner. It is generally agreed upon 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 less agreement when it comes to defining informal learning. According to Manuti and colleagues (2015), informal learning refers to the acquisition of knowledge, skills or abilities through a panel of processes, by professional experiences or through 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, Milis and Sawchuk (2003), informal workplace learning can even extend beyond paid work and prescribed work tasks. Bear et al. (2008) and Noe et al. (2013) argue that seventy-five percent of what workers learn in organizations is learned through informal learning. However, in the past much more attention has been devoted to formal learning initiatives, ignoring the relevance of informal learning (Fraser, 2010; Rytivaara & Kershner, 2012; Shapiro, 2003).

Next, a distinction is made between dimensions of informal learning. Noe, Tews and Marand (2013) categorized informal learning in three dimensions: learning from oneself (experimenting and reflecting), learning from non-interpersonal sources (reading and searching the internet) and learning from others (interacting with peers and superiors). Other authors made a distinction between individual and social informal learning (Froehlich et al. 2015; Kwakman 2003), based on the existence of a social dimension of informal learning activities. Individual informal learning stands for teachers' participation in activities at an individual level, not including a social dimension (even if the information comes from others via books for example), such as reading, experimenting, and reflecting. Social informal learning was concretized by Froehlich et al. (2015) as feedback, help and information seeking with colleagues. Feedback seeking is defined by Ashford and Cummings (1983, p. 466) as a "conscious devotion of effort toward determining the correctness and adequacy of behaviours for attaining valued end states". When seeking for feedback individuals can adapt two

different strategies (Anseel & Lievens 2006; Ashford 1986): First, by observing situations and how others respond to their behaviour. Second, by directly asking others how they proceed. This iss often a powerful and efficient method to learn in a job (Bamberger 2009). Next, help seeking refers to an adaptative strategy for coping with job difficulties or problems by asking for help (Butler 2007). Finally, relevant information seeking is about asking others for work related information, not linked to personal practice (Bamberger 2009). In addition, in the past, a distinction was made between the frequency and use of the three dimensions of social informal learning (Lecat, Beausaert, & Raemdonck, 2018). This distinction is useful given the fact that not all feedback, help or information seeking leads to the undertaking of action. Therefore we distinguish feedback, help and information frequency and feedback, help and information use.

3. School learning climate

School learning climate refers to the school's effort in terms of policies, norms and procedures in order to create an environment that encourage all continuous learning activities undertaken by teachers in order to expand their abilities and create valuable pedagogical results (Marsick, Watkins, Callahan, & Volpe, 2009; Mikkelsen & Grønhaug, 1999; Nikolova et al., 2014; Schneider, Brief, & Guzzo, 1996; Schneider, Ehrhart, & Macey, 2013). These activities include but are not limited to stimulating dialogue and collaboration, promoting team learning and feedback, encouraging teachers' involvement to develop a collective vision and setting up continuous learning opportunities (Dam & Blom, 2006; Eldor & Harpaz, 2016, Marsick & Watkins, 2003; Osborn, 2006). As collaboration climate is a main component of teachers' daily activities, it contributes to teachers' discussions and questions to each other and, then, teachers' learnings (Grosemans et al., 2015).

More concretely, learning climate is composed of three dimensions: facilitation learning climate, appreciation learning climate, and error-avoidance climate (Nikolova et al., 2014). The facilitation dimension stands for the worker's perception of policies and practices the organization sets up to provide access to learning resources. The appreciation dimension refers to the organizational incentives perceived by the worker for showing learning behaviours. These incentives can be material as well immaterial. Finally, error-avoidance dimension refers to the worker's lack of psychological safety depending of the perceived tolerance for errors in the organization (Van Dyck, Frese, Baer, & Sonnentag, 2005). Authors showed that a work learning climate that includes fear of making errors can make employees feel anxious about their job (Lee, Edmondson, Thomke, & Worline, 2004) and reluctant to learn (Edmonson, 1999). Proactive learning behaviours can be impeded by negative perceptions of the error-avoidance learning climate (Lee et al., 2004).

4. Teachers' learning climate and social informal learning

Much authors stated that a supportive school learning climate, encouraging help, feedback and collaboration is important for informal learning (Flores, 2004; Jurasaite-Harbison & Rex, 2010; Krečič & Grmek, 2008; Marsick & Volpe, 1999; Williams, Prestage, & Bedward, 2001). For example, Jurasaite-Harbison and Rex (2010) did a case study analysis, involving three elementary schools from Lithuania and United States and found that school traditions and habits play a main role in setting up an informal learning environment. Similarly, Krečič and Grmek (2008) analysed 542 questionnaires administered to Slovenian teachers and found that a school policy that fosters a learning supportive school climate, stimulates teachers to collaborate and contribute to teachers' professional development. Also, Williams and colleagues (2001) conducted 46 interviews with teachers in 11 English schools and found that a collaborative school culture fosters informal and spontaneous collaboration between teachers. Another mixed-method study with teachers including data from 115 questionnaires and 24 interviews, showed that a collaborative learning climate provides teachers with more opportunities for learning activities (Johnson, 2003). Clement and Vandenberghe (2000) conducted a three phases study and collected 39 semi-structured interviews in the first research phase, 2 case studies (including 25 interviews) and 10 condensed case studies (including 30 interviews) in the second phase and found that the positive relation between a positive learning climate and informal learning could exist because teachers have more space to ask for help, collaborate on work and share ideas by exchanging experiences.

Given these previous research results, e.g. Jurasaite-Harbison and Rex (2010) and Lee et al. (2008) who found that supporting school culture and climate create opportunities for teachers' informal learning, it is hypothesized that school learning climate plays an important role in undertaking teachers' social informal learning activities. More specifically, the following hypothesis were formulated:

H1: Facilitation of learning (learning climate dimension 1) is significantly and positively related to all six social informal learning activities dimensions.

H2: Appreciation of learning (learning climate dimension 2) is significantly and positively related to all six social informal learning activities dimensions.

H3: An error-avoidance climate (learning climate dimension 3) is significantly and negatively related to all six social informal learning activities dimensions.

5. Method

5.1. Participants and procedure

467 teachers, selected through opportunity sampling, participated in an online survey. Invitations to participate in the study were send to school principals, directly to teachers in primary and secondary schools and via social media. About half of the teachers in the sample (49%) worked in primary schools, whereas 51% worked in secondary schools in the French-speaking community of Belgium. The sample consisted of 78.4% women, which is in line with the statistics for the French-speaking community of Belgium: 82% of the primary school teachers and 63% of the secondary school teachers are women (FWB indicators, 2015). The average number of years in the teaching profession in our sample varied from 1 year to 41 years. The mean experience was 13.4 years (SD = 9.97).

5.2. Instruments

Social informal learning activities

Social informal learning was assessed using a 30 items questionnaire developed by Froehlich, Beausaert and Segers (2015) regarding respectively feedback, help and information seeking. 15 questions measured the frequency of informal learning (rate of occurrence). Each subscale (frequency of feedback, help and information seeking) was measured with five questions, on a 5-point Likert scale ranging from 'almost never' to 'very often'. An example item is: "I asked my colleagues to evaluate my work". The other 15 questions measured the use of what was informally learned (the application for a purpose). There were again five questions per subscale (use of feedback, help and information seeking), scored on a 5-point Likert scale ranging from 'not agree at all' to 'totally agree'. An example item is: "I used the received feedback for my professional development".

Confirmatory factor analysis confirmed the six factors structure and found acceptable model fit indices: $\chi 2/df = 2.688$, RMSEA = .060 and CFI = .905. Twenty-two errors terms were allowed to correlate. Cronbach's alphas for the frequency scales were .83 for feedback seeking, .74 for help seeking and .80 for information seeking. For the usage scale, Cronbach's alphas were .76 for feedback seeking, .81 for help seeking and .66 for information seeking.

Learning climate

Learning climate was measured with the validated "Learning Potential of the Workplace" scale (Nikolova et al., 2014), consisting of 9 items, measured on a 5-point Likert scale ranging from 'not applicable at all' to 'fully applicable'. This questionnaire consists of three subscales, "Facilitation learning climate", "Appreciation learning climate" and "Error-avoidance climate", each containing 3 items. Example items for each subscale are "My school offers sufficient resources to develop my professional skills", "In my school, teachers who make an effort to learn new things deserve more appreciation and prestige here" and "In my school, teachers do not dare to discuss mistakes with each other". Cronbach's alphas for the three scales were respectively .82, .85 and .85.

Control variables: teachers' experience and contract

Given previous research, the number of teaching years and the type of contract (temporary/permanent) were taken into account when doing the analysis. For example, it was found that novice teachers are more eager to learn because of the many challenge which they don't feel prepared for than their more experienced colleagues (Flores, 2005; Rolls & Plauborg, 2009). However, on the contrary, Richter and colleagues (2011) did not find differences between novice and experienced teachers when it comes to time invested in workplace learning. They do chose different learning activities. At the same time, Van Daal, Donche and De Maever (2013) found that novice teacher undertake more workplace learning activities than their elders. Finally and more specifically, Grosemans and colleagues (2015) found that novice teachers ask more questions or help, while experienced teachers are more reluctant to give feedback due to their limited experience. Next, Patrick, Elliot, Hulme and McPhee (2010) found that beginning teachers with a temporary contract identified their unsecure job as an inhibiting factor and an important barrier for learning.

5.3. Data analysis

First, preliminary analyses were done (means, standard deviations and correlations) for all variables under study (Table 11). Second, a structural equation model was constructed in AMOS, version 24.0, and included relations between learning climate dimensions on the one hand and all social informal learning dimensions on the other hand. In addition, we controlled for teachers' professional experience and contract type. An adequate goodness of fit, established with statistical indices, supports the plausibility of the relation among the variables. Two incremental indexes, the CFI and the RMSEA, were chosen. For CFI indices, values greater than .90 are typically considered as acceptable degree of consistency (Bollen 1989; Byrne 2001; Hu and Bentler 1999). For RMSEA, a value less than .05 indicates a good model fit (Hu & Bentler, 1999) while a value between .08 and .10 represents an adequate fit (Browne & Cudeck, 1993; Byrne, 2000).

Finally, before starting the analyses, normality distribution was checked for all social informal learning and learning climate dimensions. It was concluded that all data was normally distributed.

Table 11. Means, Standard Deviations and Correlations for the Variables under Study

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Contract	-	-	1										
2 Experience	13.28	9.94	.505**	1									
3 Informal learning - Feedback seeking (Freq.)	2.69	.80	-.165**	.505**	1								
4 Informal learning - Feedback seeking (Use)	3.72	.72	-.178**	-.165**	.413**	1							
5 Informal learning - Help seeking (Freq.)	3.69	.67	-.127**	-.178**	.422**	.385**	1						
6 Informal learning - Help seeking (Use)	3.87	.75	-.140**	-.127**	.279**	.440**	.501**	1					
7 Informal learning - Information seeking (Freq.)	3.31	.75	-.167**	-.140**	.427**	.392**	.671**	.547**	1				
8 Informal learning - Information seeking (Use)	4.11	.56	-.097*	-.167**	.205**	.253**	.222**	.183**	.063	1			
9 Climate - Facilitation	2.83	.97	-.111*	-.097*	.107*	.247**	.117*	.211**	.142**	.025	1		
10 Climate – Appreciation	2.38	.98	-.194**	-.111*	.130**	.175**	.124**	.226**	.149**	-.027	.483**	1	
11 Climate – Error-avoidance	2.66	1.02	-.123**	.072	-.055	-.187**	-.237**	-.335**	-.249**	-.015	-.192**	-.184**	1

Notes: *p<.05 ; **p<.01

6. Results

6.1. Preliminary analysis

Table 11 shows means, standard deviations and correlations for all variables under study. Concerning social informal learning and learning climate, it was found that almost all dimension of social informal learning correlate significantly with all learning climate dimensions, positively with facilitation and appreciation dimension and negatively with error-avoidance dimension. However, no significant correlations were found between information use and any learning climate dimension as well as between frequency of feedback seeking and error-avoidance climate. Finally, several significant correlations with control variables were found. For example, male teachers reported significantly more social informal learning and also made more use of it. Next, novice teachers reported significantly less social informal learning activities and made less use of it, except for the use of information.

6.2. Structural equation model analysis

Figure 6 presents the structural equation model. The exogenous variables were allowed to covary in the estimation of the model, within the learning climate construct and also between the control variables, i.e. teaching experience and the type of contract. We assumed that relationships existed among learning climate dimensions and between teachers' experience and type of contract. Error terms of the dependent variables were allowed to correlate. Table 12 presents the path estimates for the model. For the equation predicting social informal learning, 13 hypothesized path estimates were significant. There were significant paths between each learning climate dimension and control variables on the one hand and dimensions of social informal learning on the other hand. The assessment of the

goodness of fit in the model revealed a good fit to the data ($\chi 2/df = 3.495$, RMSEA = .080 and CFI = .985).

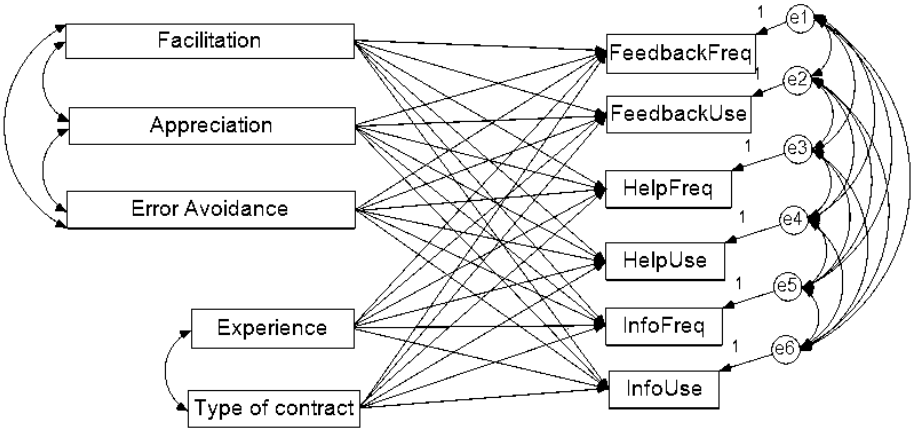

Figure 6. Structural Equation Model

The structural paths from the facilitation dimension are significantly related to use of feedback and help. These relations were positive in both cases. Therefore Hypothesis 1, Facilitation of learning (learning climate dimension 1) is significantly and positively linked to all six social informal learning activities dimensions", is partially supported.

The structural paths from the appreciation dimension are significantly positively related to use of help. Hypothesis 2, Appreciation of learning (learning climate dimension 2) is significantly and positively linked to all six social informal learning activities dimensions" is partially supported.

The structural paths from the error-avoidance dimension are significantly related to use of both feedback and help and to frequencies of both help and information seeking. These relations were all negative. Hypothesis 3, Error-avoidance climate (learning climate dimension 3) is significantly and negatively linked to all six social informal learning activities dimensions" is partially supported.

Table 12. Path Estimates of the Relations Indicated for the Structural Equation Model

From		To	β	SE	*p*
Learning climate - Facilitation	→	Feedback seeking frequency	,047	,043	,273
Learning climate - Facilitation	→	Feedback use	,145	,037	< .001
Learning climate - Facilitation	→	Help seeking frequency	,034	,035	,337
Learning climate - Facilitation	→	Help use	,078	,037	.036
Learning climate - Facilitation	→	Information seeking frequency	,053	,039	,170
Learning climate - Facilitation	→	Information use	,024	,030	,429
Learning climate - Appreciation	→	Feedback seeking frequency	,055	,042	,196
Learning climate - Appreciation	→	Feedback use	,022	,037	,552
Learning climate - Appreciation	→	Help seeking frequency	,027	,035	,433
Learning climate - Appreciation	→	Help use	,077	,037	,036
Learning climate - Appreciation	→	Information seeking frequency	,034	,038	,380
Learning climate - Appreciation	→	Information use	-,036	,030	,223
Learning climate – Error avoidance	→	Feedback seeking frequency	-,010	,036	,774
Learning climate – Error avoidance	→	Feedback use	-,089	,032	,005
Learning climate – Error avoidance	→	Help seeking frequency	-,136	,030	< .001
Learning climate – Error avoidance	→	Help use	-,209	,031	< .001
Learning climate – Error avoidance	→	Information seeking frequency	-,155	,033	< .001
Learning climate – Error avoidance	→	Information use	-,004	,025	,886
Experience	→	Feedback seeking frequency	-,009	,004	,042
Experience	→	Feedback use	-,004	,004	,320
Experience	→	Help seeking frequency	-,007	,003	,047
Experience	→	Help use	-,015	,004	< .001
Experience	→	Information seeking frequency	-,016	,004	< .001
Experience	→	Information use	,005	,003	,089
Contract	→	Feedback seeking frequency	-,157	,091	,086
Contract	→	Feedback use	-,171	,080	,031
Contract	→	Help seeking frequency	-,053	,075	,475
Contract	→	Help use	,043	,079	.585
Contract	→	Information seeking frequency	-,036	,083	.667
Contract	→	Information use	-,181	,064	,005

Finally, concerning the control variables, it was found that the type of contract (temporary or permanent) related significantly negatively to the use of feedback and information sought. A teacher with a temporary contract uses more the information s/he receives than teachers with a permanent contract, regardless of his/her teaching experience. Next, teachers' number

of years of experience relates significantly negatively to the frequency of information, help and feedback sought and the use of help.

6.3. On the relation between teachers' experience and contract type and their social informal learning

Given the important role that teachers' experience and contract type play when it comes to social informal learning, an additional analysis of variance (ANOVA) was conducted, including all variables under study.

Table 13. Teachers' Groups Based on Experience and Type of Contract

	Temporary contract	Permanent contract
Novice teachers (-5 years)	Group 1: n = 71	Group 2: n = 26
Experienced teachers (5+ years)	Group 3: n = 50	Group 4: n = 300

In an effort to better understand the role of teachers' background characteristics, contract type and teaching experience, on their social informal learning, four groups of teachers were created, depending on their teaching experience (novice teachers with less than 5 years of experience versus experienced teachers with 5 years or more experience (e.g. Grosemans et al., 2015; Merav & Avidov-Ungar, 2019; Shoshani & Eldor, 2016) and type of contract (temporary versus permanent). Table 13 shows how the teachers were divided across the four groups.

These results of the ANOVA (Table 14) showed significant differences between the four groups for all variables under study. More specifically, it was found that young teachers with a temporary contract perceived the school learning climate as more facilitating, showing more appreciation of their learning behaviours and had less fear of making errors than experienced teachers with a permanent contract. Moreover, group 1 (novice teachers with a temporary contract) reported showing higher frequency of feedback and information seeking and make more use of the feedback and help received. Finally, experienced teachers with a temporary contract (group 3) made more use of the information received than their novice and experienced colleagues with a permanent contract

Table 14. ANOVAs on Teachers' 4 Groups Based on Background Variables

	F	p-value	Post-hoc (Bonferroni)
Feedback Frequency	5.903	.001	1 (2.94) > 4 (2.58)
Feedback Use	5.104	.002	1 (3.90) > 4 (3.64) ; 3 (3.95) > 4 (3.64)
Help Frequency	2.657	.048	/
Help Use	5.630	.001	1 (4.13) > 4 (3.78)
Information Frequency	5.394	.001	1 (3.57) > 4 (3.22)
Information Use	4.550	.004	2 (3.86) < 3 (4.32) ; 3 (4.32) > 4 (4.09)
Learning Climate – Facilitation	3.111	.026	1 (3.11) > 4 (2.76)
Learning Climate - Appreciation	9.208	<.001	1 (2.82) > 4 (2.23)
Learning Climate – Error Avoidance	2.654	.048	1 (2.41) < 4 (2.75)

7. Conclusion and discussion

In the past decades, interest has increased in teachers' professional development because of a fast changing society in which knowledge evolves quickly. Teachers develop themselves professionally by undertaking formal and mostly informal learning activities. The latter is found to be most effective for high-quality performance and employability. Especially social informal learning such as information, help and feedback seeking is argued to play a positive role in teachers' development (e.g. Lecat, Beausaert, & Raemdonck, 2018). In addition, literature argues that the amount of informal learning teachers undertake, might depend on the learning climate in their school. Given these premises, this study studied the relation between the learning climate and teachers' social informal learning, i.e. the frequency and usage of information, help and feedback seeking. This study is innovative because it is the first study that researches the relation between learning climate and social informal learning of teachers. The specific focus on social informal learning is unique. Furthermore, the fact that learning climate is conceptualised and measured as a multidimensional construct is not unique but adds added value to the study.

It was hypothesized that all learning climate dimensions relate significantly positively (facilitation and appreciation of learning, dimensions 1 and 2) or negatively (error-avoidance climate, dimension 3) to the amount of information, help and feedback sought as well as to

what extent they make use of it. In the analysis we controlled for teachers' years of experience and type of contract.

The results showed that, first, social informal learning, specifically the fact that teachers make use of feedback and seek help, is determined by the school's learning climate. All three learning climate dimensions are related to help use and both the facilitation and error avoidance dimensions are related to feedback use. In other words, the more teachers experience their work environment as facilitating and tolerant to errors, the more they use the feedback they asked for. For appreciative learning climate no such effect was found as appreciation includes a message of encouragement rather than an evaluation component which therefore does not lead to increased feedback use. Furthermore, the more teachers experience their work environment as facilitative and appreciative for participation in learning behaviour, the more teachers use the help received. Furthermore, experiencing the school as tolerant towards making errors makes teachers seek for more information and help. This is in line with previous research that found that a learning climate that installs fear of making errors can make employees reluctant to learn (Edmonson, 1999) and that proactive learning behaviours can be hindered by an error-avoidance learning climate (Lee et al., 2004). These findings can also be linked to previous researches that showed that a supportive school learning climate can encourage and increase both help and feedback sharing amongst teachers (e.g. Jurasaite-Harbison & Rex, 2010; Marsick & Volpe, 1999). Finally, and in contrast to what was expected a learning climate that facilitates learning behaviours does not seem to increase the frequency of social informal learning activities. This might indicate that it is not the frequency of feedback, information and help seeking that fosters learning, but what is done with the feedback, information or help received. In other words, this result might argue for making a distinction between frequency and use of feedback. Next, and again in contrast to what was expected, a stimulating learning climate did not help teachers to make better use of the information received. The latter might have to do with the fact that information, contrary to feedback, is neutral not always resulting into concrete actions. In other words, feedback mostly contains the implicit invitation to use it in practice, while information does not contain such invitation. The fact that preliminary analyses showed that frequency of information seeking and information use are not correlated provide arguments which go in that direction.

Second, it was found that teachers undertake less social informal learning activities (feedback, help and information seeking) by gaining teaching experience. This goes against Grosemans and colleagues (2015) findings showing that more experienced teachers do not necessarily undertake less learning activities than their less experienced colleagues. Our findings may indicate that more experienced teachers no longer feel the need to engage in as many learning and professional development activities as beginning teachers do. As Ericsson (2009) indicated, professionals need to invest about 10 years of work to become an expert. It is possible that experienced teachers have more self-knowledge and may be better able to locate the knowledge needed and therefore undertake less social informal learning. Supporting this assumption, Geeraerts, Vanhoof and Van den Bossche (2018) found that

older teachers ask their colleagues for advice and information less when it comes to teaching subjects, classroom management or innovative teaching methods.

Third, it was found that the type of contract relates to how much teachers make use of received feedback and information. More specifically, differences were found between novice teachers with a temporary contract versus experienced teachers with a permanent contract in how they perceive the learning climate and the undertaking of social informal learning activities. Novice teachers with a temporary contract found the learning climate more conducive to learning behaviours, more rewarding to learning and less punitive to errors. We can assume that novice teachers have either a more positive vision of the learning climate or that different sub-climates might coexist depending on the colleagues with who teachers collaborate. The later explanation is in line with findings from Geeraerts, Van den Bossche, Vanhoof and Moolenaar (2017) who observed a tendency for homophily in the youngest cohort of teachers when learning professionally. Young teachers tend to discuss work and collaborate more with teachers from their own age group, which demonstrates the existence of learning sub-climates inside a school. These findings suggest that teachers of the same age can have similar sensitivity of lacking skills or learning.

7.1. Limitations and suggestions

The study results should be interpreted with caution, keeping four major limitations in mind. First, the study was based on self-reports. Although it is believed that the learner him/herself is in the best position to indicate how much he/she learns and that it is how the learner perceives the learning climate that will determine his/her learning, in general, future research could also take into account the perception of pupils and principals. Next, also observations could be done to score the learning climate of a school to avoid using only teachers' perceptions about the learning climate.

Second, participants participated voluntarily in the research. Given the voluntary participation, it is possible that they had a greater commitment to workplace learning than their colleagues who did not participate in the study. According to Lohman and Woolf (2001) schools with a less favorable learning culture towards learning do not participate in this kind of research (Flores, 2004). Future research could avoid this potential selection-bias by randomly selecting teachers in randomly selected schools and trying to augment the response rate of the randomly selected teacher group.

Third, this research is cross-sectional and did not allow us to look at learning climate and teachers' workplace learning over time. In other words, no conclusions on causality can be drawn. Further researches investigating teachers' perception of the learning climate and their social informal learning over time across career phases might help to expand our knowledge on teachers' informal learning in the workplace and the role of the learning climate.

Finally, the sample size and the unequal distribution of participants concerning the number of years of experience is a limitation and did not allow us to make a more detailed distinction between teachers from different career phases, such as suggested by Huberman (1993) or Sammons, Day, Kington, Gu, Stobart and Smees (2007). In this research, only a

distinction was made between novice and expert teachers. Huberman (1993) for example categorized six professional career stages of teachers: commitment (0-3 years of experience), identity and efficacy (4-7), managing changes in role and identity (8-15), work-life tensions (16-23), challenges to sustaining motivation (24-30) and sustaining/declining motivation (31+). A greater distinction between teachers' professional career stages could be applied in future research.

7.2. Practical implications

The results of this study show that it is important to raise schools and principals' awareness about the important role of a learning climate for workplace learning, and how to install a learning climate, especially paying attention to 'facilitation' and making sure that 'error avoidance' is not taking place.

Given the importance of the facilitation of teachers' learning and the impact of teachers' perception of the need to avoid error, schools and principals should pay more attention to creating a supportive learning climate in which mistakes are allowed and learning activities facilitated by providing easy access to learning resources (time and financial resources) but also to other teachers' knowledge to foster teachers' exchanges. Schools leaders can facilitate the undertaking of learning activities (and thus increase the facilitation learning climate dimension) by proving resources to foster feedback, help and information sharing. For example, principals can help setting up an online sharing platform, pay attention to teachers' learning experiences during meetings, and create cozy inviting common rooms where knowledge exchange can flourish. Another idea is to enhance teachers' awareness about colleagues' knowledge and skills. According to Geeraerts, Vanhoof and Van den Bossche (2018), enhancing the "network literacy" of teachers can strengthen their professional development. Baker-Doyle and Yoon (2010, 2011) called this phenomenon "expertise transparency" and argued that creating awareness of the "silent experts" within a school is needed in order to increase teachers' learning and development. In this sense, creating a "knowledge and skills" map in a school can foster teachers' social informal learning. Furthermore, according to Cross and Borgatti (2004), schools can boost teachers' knowledge exchanges by unraveling which teachers are isolated in the school team, and thus cannot share their knowledge or ideas,. The error management school policy could also help teachers to dare to make mistakes and learn from it, using trial and error and experimentations. For example, setting up meeting to discuss experiments that teachers did in their classes, can make meeting very insightful.

The present results also showed that more experienced teachers with a permanent contract undertake less feedback, help and information seeking and make less use of it, especially when it comes to the help received. These results seem to imply that giving teachers a permanent contract might undermine their (social) workplace learning and thus their professional development. The fact that Belgian teachers cannot easily be fired once they get a permanent contract, does not help.

8. References

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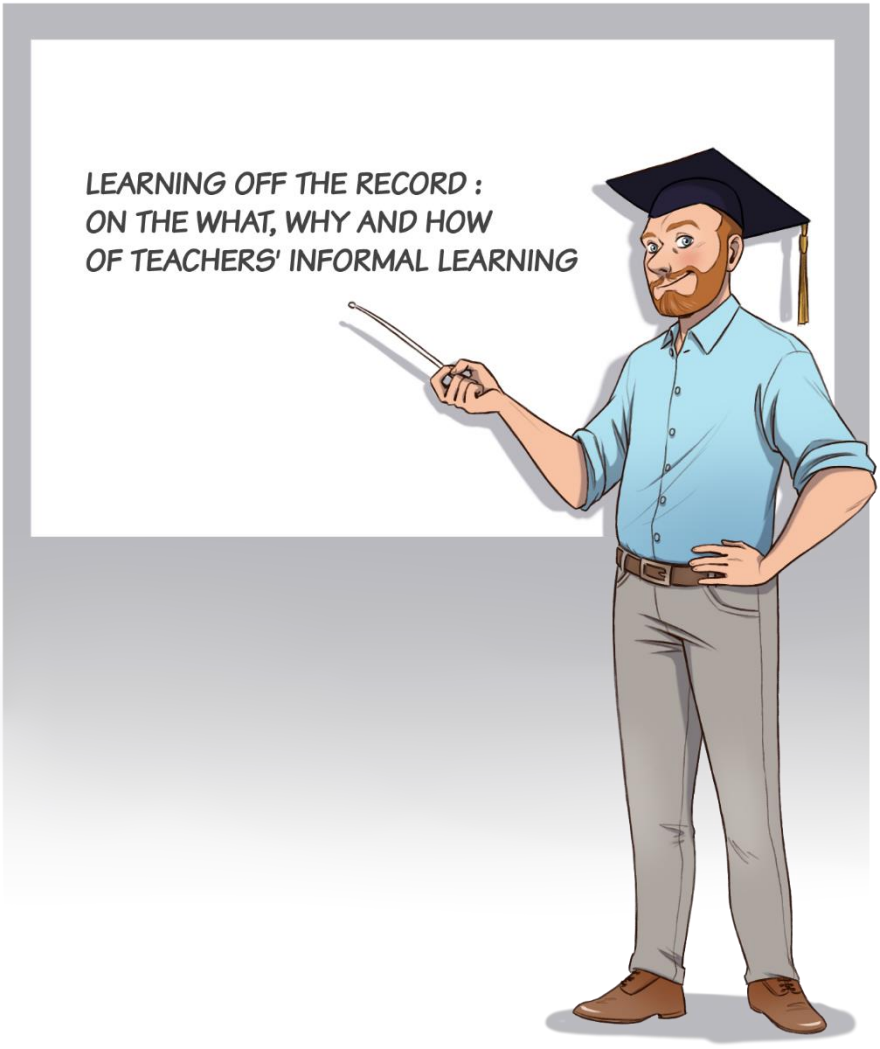
Chapitre 6

Discussion générale



Discussion générale

Ce dernier chapitre propose une discussion portant sur les résultats obtenus suite aux quatre études qui composent la présente thèse et leurs apports dans le champ de l'éducation, en particulier en relation avec les études présentes dans la littérature scientifique. Cette comparaison permet d'inscrire les résultats de ces quatre études dans la continuité de la recherche scientifique du domaine et de préciser la mesure dans laquelle ces études font également œuvre d'originalité. La discussion se présente dans la logique identique à celle de l'ensemble de la thèse. Elle s'amorce par un rappel de la problématique, présente les résultats et en précise les implications pratiques et les limites. Les résultats et le lien qui unit les études de cette thèse sont présentés en vue de viser l'objectif principal de la thèse, à savoir :

> Décrire et documenter la manière dont les enseignants apprennent informellement, en tant qu'élément central de leur développement professionnel, et explorer les relations possibles à la fois vers leurs effets en termes de compétences professionnelles et ses antécédents en termes de climat d'apprentissage à l'école.

1. Contexte et problématique

L'introduction de la présente thèse a présenté la mise sous pression du développement professionnel des enseignants selon trois principaux enjeux. La responsabilité d'enseignement et de son développement professionnel en tant qu'enseignant est revigorée premièrement par les changements continus de la société (Butler, 2005 ; Kyndt et al., 2016), deuxièmement par les réformes et les innovations pédagogiques (Butler, 2005 ; Kyndt et al., 2016) et troisièmement par la volonté politique de permettre l'égalité des chances et de la réussite parmi l'ensemble des élèves (Kremer-Hayon, Vonk, & Fessler, 1993). En effet, l'évolution rapide et continue de tous les domaines de la société oblige les enseignants de toutes les matières à se tenir à jour des changements par une veille médiatique et un apprentissage constant. Ensuite, dans une autre mesure, les innovations pédagogiques, concernant l'ensemble des enseignants, les poussent à s'informer proactivement et à modifier leurs pratiques, en y insérant en parallèle les changements didactiques de leur propre discipline. Enfin, la volonté de permettre à tous les élèves les meilleures chances de réussite et d'émancipation dans un contexte d'excellence les poussent à se remettre continuellement en question et à s'adapter.

L'introduction a permis de présenter et de développer la problématique du développement professionnel des enseignants, leur apprentissage sur le lieu de travail et l'émergence puis la croissance du terme d'apprentissage informel et son application chez les enseignants. Cette introduction a été l'occasion de présenter les points d'ancrage théoriques issus de la littérature en psychologie du développement, en sciences de l'éducation et en psychologie des organisations, et servant de fondation aux études rapportées dans cette thèse.

Ces études, au centre des trois domaines précités et mêlant les approches inductives et hypothético-déductives et les méthodes quantitatives et qualitatives, place les activités informelles d'apprentissage des enseignants et son étude au cœur du processus de thèse. Le phénomène de l'apprentissage informel des enseignants, et des activités qu'ils entreprennent ou qu'ils suivent en ce sens, permettra de proposer des pistes pour soutenir le développement professionnel des enseignants, en relation avec les compétences que cet apprentissage permet de développer et selon le climat scolaire d'apprentissage.

Le constat de l'importance de l'apprentissage informel des enseignants comme processus essentiel au développement professionnel de ceux-ci a mené l'écriture de cette thèse avec pour but de permettre de mieux soutenir ce dernier, en dégageant des pistes concrètes à mettre en place sur le terrain, dans les écoles. La question de l'excellence de l'enseignement par l'excellence des enseignants a accompagné en toile de fond cette préoccupation.

2. Synthèse des résultats

Évaluer la qualité de l'enseignement est une démarche qui nécessite des mesures d'accompagnement pédagogique des enseignants et des mesures de valorisation de la fonction d'enseignement (Bernard, 2011; Lessard, 2007).

Vouloir décrire et documenter la manière dont les enseignants apprennent informellement, les effets de cet apprentissage en termes de compétences professionnelles ainsi que les antécédents en termes de climat d'apprentissage à l'école demandent de commencer par définir l'apprentissage informel des enseignants. Cela a été fait dans cette thèse par deux moyens, (a) via les articles scientifiques d'une part, et selon les conceptions des enseignants, récoltées par entretiens d'autre part. Ensuite, les relations de notre objet d'étude avec d'éventuels (b) effets et (c) antécédents ont aussi été étudiées pour dégager des pistes de soutien de l'apprentissage informel des enseignants.

2.1 Objectif 1- Décrire l'apprentissage informel des enseignants

Le travail doctoral commence par l'établissement du cadre conceptuel dans lequel il s'inscrira par la suite et, par là-même, la compréhension du phénomène d'apprentissage informel des enseignants. La description du concept central de cette thèse s'est développée en deux phases. Premièrement, l'investigation de la littérature scientifique existante sur l'apprentissage informel et uniquement sur celui réalisé par les enseignants, quel que soit leur niveau d'enseignement. Deuxièmement, la perception que possèdent les enseignants des activités informelles d'apprentissage qui ont lieu dans leur contexte professionnel a été étudiée. Enfin, ces deux conceptions sont associées et comparées dans la présente conclusion.

2.1.1 Première étape : revue de littérature systématique

Malgré un enrichissement de la littérature existante sur l'apprentissage informel des enseignants ces dernières années, le concept manque encore actuellement de clarté (Clarke, 2005 ; Hoekstra et al., 2007 ; Schugurensky, 2015). Ce concept, dans de nombreux articles,

est encore trop souvent considéré comme une catégorie floue et globale qui contient tout ce qui ne rentre pas dans l'apprentissage formel ou qui se confond tout simplement avec l'apprentissage sur le lieu de travail. Les définitions coexistent et abordent des concepts, parfois assez proches, parfois exclusifs.

Au constat qu'il n'existe actuellement aucune définition consensuelle de l'apprentissage informel des enseignants dans la littérature scientifique se greffe le deuxième constat que les études diffèrent dans leur représentation du concept, parfois en s'opposant. Ces définitions se rapprochent parfois de celles utilisées par Hoekstra et ses collaborateurs (Hoekstra et al., 2007 ; Hoekstra, Korthagen, Brekelmans, Beijaard, & Imants, 2009 ; Hoekstra, Brekelmans, Beijaard, & Korthagen, 2009), dans lesquelles l'apprentissage informel des enseignants se résume à l'engagement dans des activités d'apprentissage conduisant à une modification du comportement ou de la cognition, que cet engagement soit conscient ou non. Se rapprochant de cette définition, Schei et Nerbø (2015) ajoutent cependant que l'apprentissage informel des enseignants se fait au hasard sur le lieu de travail, de manière non systématique. Dans la même idée, Jurasaite-Harbison (2009) définit l'apprentissage informel des enseignants comme étant principalement non planifié ou spontané, dans des contextes multiples à partir de sources diverses. De plus, les auteurs précédents rejoignent aussi Lohman (2000, 2003, 2005, 2006) sur l'idée que ces activités visent l'acquisition et l'utilisation de nouvelles connaissances et de nouvelles compétences. Lohman avance pour sa part que l'apprentissage informel des enseignants se fait par des activités consciemment initiées dans le contexte et le lieu de travail, par un effort volontaire, physique, cognitif et émotionnel.

Grosemans et ses collègues (2015) présentent dans leur définition plusieurs similitudes et différences avec les précédentes. Dans les points communs, la définition comporte un engagement non systématique, spontané et le plus souvent inconscient, basé sur les situations de travail quotidiennes. Par contre, si les enseignants développent leurs compétences et connaissances, les activités suivies ne le sont pas en visant des résultats précis d'apprentissage. De plus, contrairement aux autres, ces auteurs ajoutent explicitement que l'apprentissage informel des enseignants se fait à la fois de manière individuelle et en collaboration.

En résumé, les définitions partagent de nombreux points communs mais ajoutent aussi des aspects parfois complémentaires, parfois contradictoires. Les définitions n'ont pas la même portée et n'englobent donc pas exactement les mêmes activités d'apprentissage. Il n'existe donc encore aucune définition complète et globale du concept d'apprentissage informel des enseignants. Sur la base du constat de la polymorphie de l'apprentissage informel des enseignants et en prenant en compte ses diverses dimensions et caractéristiques, la définition que nous proposons a été souhaitée la plus englobante possible, pour donner une image complète du phénomène. L'apprentissage informel des enseignants se définit donc comme « l'apprentissage des enseignants, en s'engageant intentionnellement ou non intentionnellement dans des activités individuelles, interactives, non interactives et instructives ou autodirigées qui améliorent le développement professionnel de leurs connaissances et de leurs compétences ». À cette définition pour, d'une part, insister sur l'existence d'un apprentissage implicite ainsi que, d'autre part, pour prendre en considération

les différentes activités que les enseignants suivent, il faut ajouter : « Cet apprentissage peut être implicite. Ces activités comprennent, sans s'y limiter, les activités d'introspection, d'apprentissage par la lecture, d'interactions et de collaborations avec les collègues, d'échange de feedbacks, de partages d'expériences et d'idées. ».

Cette définition très large pourra servir de point de départ à l'alignement de la littérature scientifique portant sur l'apprentissage informel des enseignants puis à l'approfondissement du sujet, entre autres en passant par les études développées dans cette thèse.

Toujours dans l'objectif précité de description de l'apprentissage informel des enseignants, la revue de littérature scientifique a permis également de dresser la liste des moyens de mesure de l'apprentissage informel des enseignants utilisés par le passé. Le premier constat met en évidence une prédominance de l'approche qualitative dans la recherche sur l'apprentissage informel des enseignants, en particulier par l'intermédiaire d'entretiens semi-structurés. L'utilisation d'entretiens semi-structurés permet aux chercheurs de reformuler leurs questions et de préciser les concepts (Diefenbach, 2009). Cette possibilité de reformulation est particulièrement utile dans ce cas-ci, puisque le concept d'apprentissage informel des enseignants peut s'avérer assez vague et sujet à interprétation, comme cela a été indiqué précédemment. Dans le cas de l'analyse d'un concept comme celui de l'apprentissage informel des enseignants, la liberté méthodologique des entretiens semi-structurés et la créativité qu'ils permettent représentent une force. Ce type d'entretiens peut également permettre de prendre en compte, de manière plus large, la perception des enseignants de leurs apprentissages informels et les principales activités par lesquels ils sont conscients d'apprendre informellement. L'étude de ces deux sujets sera traitée dans le prochain chapitre portant sur la deuxième phase de l'objectif descriptif adopté. Cela se fera par l'approche phénoménologique au moyen d'une deuxième étude visant à mieux décrire l'apprentissage informel des enseignants de manière générale. Cependant, d'autres méthodes peuvent être utilisées pour mesurer la manière dont les enseignants apprennent informellement. Par exemple, l'utilisation de questionnaires permet de mesurer, dans une volonté objectiviste, les relations qu'entretiennent les activités informelles d'apprentissage des enseignants avec d'autres concepts (le climat scolaire d'apprentissage, les compétences d'employabilité et les comportements d'innovation au travail). Cette méthode de récolte de donnée, jointe à une analyse statistique, permet de mieux objectiver les informations du terrain et de permettre une plus grande généralisation par le biais de normes statistiques. Enfin, les entretiens semi-structurés et les questionnaires supposent une conscience claire des enseignants des apprentissages informels qu'ils font, mais d'autres moyens de mesure peuvent aussi être utilisés afin de contourner ce problème et apporter une autre vision du phénomène, notamment son contexte et sa dimension sociale. Par exemple l'utilisation de badges sociométriques, de petits dispositifs permettant de cartographier les déplacements et les temps de proximité des enseignants et donc leurs interactions formelles et informelles, apporte une vision plus objective des échanges sociaux qu'entreprennent les enseignants, sans omettre ceux dont ils ne sont pas conscients ou ne se souviennent pas systématiquement (Kim, McFee, Olguin, Waber, & Pentland, 2012). Une autre méthode possible est liée à l'analyse du réseau social (Carrington, Scott, & Wasserman, 2005 ; Coburn & Russell, 2008).

Cette méthode permet elle aussi de cartographier, mais de manière théorique, la représentation du réseau social, et donc des ressources d'apprentissage social, que l'enseignants a construit autour de lui. Enfin, la simple observation sur le terrain, la moins invasive possible, peut également permettre de se rendre compte de nombreux phénomènes dont les enseignants ne sont pas eux-mêmes conscients.

2.1.2 Deuxième étape : analyse phénoménologique

La deuxième étape dans la volonté de décrire l'apprentissage informel des enseignants, dont nous avons posé les jalons dans le chapitre précédent, passe par la prise en compte de la perception qu'ont les enseignants de leur apprentissage informel et de la manière dont ils l'acquièrent par diverses activités informelles. Dans cette optique, 41 enseignants volontaires d'écoles primaires et secondaires de la Fédération Wallonie-Bruxelles ont été interrogés sur leur perception de leurs apprentissages informels. Ensuite, la technique analytique d'interprétation phénoménologique fut appliquée sur leurs verbatims, afin de se concentrer sur l'analyse qualitative de la signification qu'ils donnent à leur développement professionnel par des activités informelles d'apprentissage de leur métier (Larkin et al., 2006).

Les premiers résultats qui découlent de ces analyses montrent que les typologies de l'apprentissage sur le lieu de travail de Kyndt et Beausaert (2017) et d'apprentissage informel de Noe, Tews et Marand (2013) sont toutes deux confirmées par les données récoltées auprès des enseignants. En effet, les cinq dimensions de Kyndt et Beausaert (basées sur les trois continuums de Jacobs et Park, 2009), à savoir le lieu de l'apprentissage, la planification, le rôle du formateur/coach, le rôle des pairs et la proactivité de l'apprenant, et les trois dimensions de Noe et ses collègues (2013), à savoir l'apprentissage par soi-même, par les autres et par des sources externes mais sans composante interpersonnelle, se retrouvent dans ce que les enseignants rapportent de leurs activités informelles d'apprentissage. Ces deux typologies se trouvent confirmées à la fois parce qu'elles englobent l'ensemble des activités rapportées, sans qu'aucune ne se retrouve en dehors, et parce que le classement qu'elles proposent a du sens pour le tri des activités Le cadre théorique de l'introduction montre que l'apprentissage sur le lieu de travail ou « workplace learning » fait référence à l'apprentissage professionnel continu regroupant à la fois les activités formelles et informelles d'apprentissage, par-delà les frontières physiques et géographiques des écoles (par ex. Stern & Sommerlad, 1999). Premièrement, concernant les activités d'apprentissage présentes à l'intérieur de ces typologies, les entretiens ont montré que les enseignants rapportent majoritairement apprendre socialement, à partir de l'expérience des autres, à la fois passivement en les écoutant ou en les observant et plus activement en demandant des conseils ou en discutant de questions qu'ils ont. Ces résultats confirment les recherches antérieures de Collin (2002), qui ont mis en avant que les gens peuvent apprendre des expériences des autres par la discussion, l'écoute ou l'observation. Les analyses des entretiens nous montrent aussi que les enseignants apprécient les avis et les expériences de leurs collègues, quelques soient les moyens dont ils les obtiennent. De manière générale, les occasions d'interactions et d'échanges ont lieu dans la salle des professeurs, dans laquelle les enseignants se rencontrent, ou au cours de réunions de travail. Mawhinney (2010) a également constaté que les enseignants apprécient beaucoup les rencontres dans la salle des professeurs et les réunions

du personnel parce qu'elles offrent des occasions d'interactions sociales. De plus, comme cela a été mentionné précédemment, les enseignants peuvent aussi apprendre à partir d'observations directes, avec ou sans interaction (Kyndt et al., 2016). Ensuite, dans la lignée des résultats de Skule (2004), en mettant en relation les entretiens et en extrayant les informations les plus saillantes, il a été constaté que les enseignants rapportent que leurs collègues directs, considérés comme des experts de domaines précis, ont un rôle essentiel dans leurs apprentissages informels. Ces résultats vont dans le sens des découvertes de Skule (2004) qui met en avant que l'interaction avec des collègues et des experts est considérée comme primordiale, et de Christensen (2013) qui montre qu'il est plus facile de communiquer, d'échanger et d'obtenir le soutien des collègues qui partagent de plus nombreux points communs (mêmes classes, mêmes matières,…). Cependant, même si les enseignants des écoles primaires et des écoles secondaires s'accordent pour dire que les discussions et le partage avec des collègues directs sont les activités d'apprentissage les plus centrales, l'expression « collègues directs » ne possède pas la même signification pour ces deux groupes. Les enseignants du secondaire distinguent les collègues enseignant les mêmes matières qu'eux, en les considérants comme des experts du sujet enseigné, et les collègues enseignant dans la même classe, considérés comme des personnes-ressources pour les difficultés de gestion de classe. Pour les enseignants du secondaire, ces deux catégories de collègues forment ensemble le groupe des « collègues directs », en excluant les autres membres du personnel enseignant. En ce qui concerne les enseignants du primaire, plus isolés dans leur classe individuelle et ayant en charge la majeure partie des matières, le groupe des « collègues directs » est formé de l'ensemble des enseignants de l'école, sans distinction de matière ou de niveau. La plupart des apprentissages sociaux, issus des interactions avec les autres, ont lieu entre les murs de l'école et pendant la journée de cours, aux moments où élèves sont en classe avec d'autres enseignants ou lorsqu'ils sont en récréation. Durant ces apprentissages par d'autres, les entretiens révèlent aussi que les enseignants rapportent avoir parfois l'impression d'être jugés par leurs collègues s'ils rapportent une difficulté à laquelle ils sont confrontés ou lorsqu'ils demandent un avis ou un feedback sur leurs pratiques. Ils ont également rapporté craindre de ne pas recevoir d'avis honnêtes de la part de leurs collègues. Cela rejoint les considérations discutées par Baert, De Rick et Van Valckenborgh (2006). Cependant, malgré cette crainte, plusieurs enseignants ont émis le souhait de bénéficier d'un meilleur soutien de leurs collègues, par exemple via la mise en place de réunions plus fréquentes entre collègues et de groupes de partage d'expérience. Cela rejoint, par exemple, certaines conclusions de Kyndt et ses collaborateurs (2016).

Deuxièmement, en sus de ces activités informelles sociales d'apprentissage des enseignants, ceux-ci rapportent aussi apprendre de sources non-interpersonnelles, selon la typologie de Noe et al. (2013). Cette catégorie comprend toutes les activités dans lesquelles le savoir est tiré d'autres personnes, mais via des sources qu'ils ont construites et sans dimension sociale dans l'apprentissage. Par exemple, l'apprentissage par des livres, blogs, syllabus ou vidéos permet d'acquérir des savoirs que d'autres personnes ont explicités et mis en forme. Cette forme d'activités d'apprentissage possède la caractéristique d'être principalement délibérative et nécessite des recherches proactives et ciblées de la part des enseignants pour trouver les sources d'apprentissage avant de se concentrer sur les contenus

présents. Concernant les contenus recherchés, ces activités de recherche et de lecture (ou autres) sont principalement entreprises dans le but de trouver de nouvelles idées pédagogiques ou didactiques à mettre en pratiques. Cela est conforme aux recherches antérieures qui indiquent que ce type d'activité d'apprentissage est entrepris à la recherche de ressources et d'informations utiles (Noe et al., 2013).

Troisièmement, avec ces activités informelles d'apprentissage social et de sources non-interpersonnelles, les enseignants peuvent aussi apprendre par eux-mêmes. Ce type d'apprentissage, le moins rapporté lors des entretiens, comprend les expérimentations, les essais-erreurs ainsi que les activités d'étude, d'analyse et d'optimisation des pratiques de travail ou des compétences. Cela peut se faire soit avant une activité d'enseignement, par exemple en la préparant ou en y pensant, soit pendant une activité, par exemple en réfléchissant à ce qui se passe et à d'autres manières de faire ou enfin soit après l'action, par exemple en y repensant pour l'améliorer.

2.1.3 Association des deux étapes de l'objectif 1

Le premier objectif de cette thèse, à savoir la description de l'apprentissage informel des enseignants, s'est développé en deux étapes. Premièrement, la revue de littérature a mis en avant l'absence de construit clair de ce concept, principalement formé de l'adjonction de multiples définitions ayant de nombreux points communs et quelques aspects contradictoires. Sur la base de ces résultats, elle présente une définition globale et unifiée de l'apprentissage informel des enseignants. La revue de littérature a également montré la variété des moyens de mesure du concept polymorphe de l'apprentissage informel des enseignants, avec une prévalence des entretiens semi-structurés et des questionnaires. Elle suggère qu'une association de plusieurs mesures, quantitatives et qualitatives, permettrait de saisir plus finement l'apprentissage informel des enseignants. Deuxièmement, à ces résultats de la revue de littérature, mettant en évidence une réalité théorique, basée sur une revue des principaux articles publiés sur le sujet, s'ajoute une réalité sociale de terrain, rapportée par des entretiens d'enseignants. Ces derniers rapportent apprendre principalement informellement dans leur travail quotidien, via l'utilisation d'une grande variété d'activités informelles d'apprentissage. De plus parmi ces activités rapportées, l'apprentissage par les autres, de manière sociale, est prégnant.

Le premier objectif de cette thèse est donc rencontré. L'apprentissage informel des enseignants a été décrit à la fois en comparant ses définitions, en listant la liste des activités entreprises par les enseignants et en se basant sur les conceptions et la signification qu'en donnent les enseignants. Il apparait comme central et essentiel pour le développement professionnel des enseignants, en particulier via sa composante sociale, mais nécessite également de se pencher sur les effets qu'il possède sur les compétences et comportements des enseignants. Cela fait lien avec le deuxième objectif de cette thèse, mise en place dans l'introduction et auquel une réponse sera apportée dans le chapitre suivant.

2.2 Objectif 2- Mesurer les effets de l'apprentissage informel des enseignants sur leurs compétences professionnelles et l'innovation

Ce travail doctoral, une fois les concepts éclaircis et le phénomène mis en lumière, s'est penché sur son influence vis-à-vis des compétences des enseignants et de leurs comportements d'innovation. En effet, l'apprentissage n'a de sens que s'il permet un transfert et améliore les compétences ou influence les comportements de l'apprenant. Les écoles sont dynamiques par nature et évoluent constamment. C'est la raison pour laquelle il est important d'investir dans le capital humain des travailleurs du secteur, et en particulier dans le corps enseignant. En gardant cela à l'esprit, le développement professionnel et les compétences du personnel enseignant doivent être soutenus par le biais de leurs apprentissages continus. Or, d'après le Centre pour la Recherche et l'Innovation de l'Enseignement (CERI) de l'OCDE, par les voix de son directeur Dirk van Damme (2014) et de la chercheuse Sonia Guerriero (2017), les professionnels européens de l'enseignement ne disposent pas de l'expertise et de la flexibilité nécessaires pour relever les défis de l'innovation en éducation. Le CERI est un organisme de l'OCDE qui mesure des indicateurs-clés, effectue et promeut des recherches internationales comparatives, qui explore diverses approches innovantes et tend à aider les rapprochements entre la politique, la recherche et l'innovation. Selon le CERI, donc, les enseignants manquent de compétences professionnelles, en particulier l'expertise et la flexibilité, et n'ont pas assez de comportements d'innovation au travail. Dans le but de faire le lien entre les apprentissages des enseignants et les compétences enseignantes, une troisième étape a été établie pour cette thèse et une étude empirique a été mise en place. Les compétences enseignantes retenues comme essentielles sont celles liées aux compétences d'employabilité, qui comprend l'expertise, la flexibilité, l'anticipation/optimisation, l'esprit d'équipe et l'équilibre entre vie privée et vie professionnelle (Van der Heijde & Van der Heijden, 2006) et les comportements d'innovation au travail (création, promotion et réalisation de nouvelles idées ; Janssen, 2000, 2003). Sachant cela, et pour soutenir le développement professionnel des enseignants, il est nécessaire d'en mesurer les relations avec les apprentissages en milieu scolaire.

La littérature scientifique nous présente plusieurs relations existantes entre les compétences d'employabilité et les comportements d'innovation au travail. De manière globale, Stoffers (2014) a constaté l'existence de liens importants entre les compétences d'employabilité et les comportements d'innovation au travail dans divers modèles utilisant l'analyse de modélisation par équation structurelle. De manière particulière, selon Carmeli et al. (2006), l'expertise permet de mobiliser et de mettre en place des pratiques innovantes. Grant et Ashford (2008) ont montré que la flexibilité et l'anticipation, deux dimensions des compétences d'employabilité, sont deux conditions préalables à la pensée innovante et la mise en place des innovations imaginées par l'imagination, la sélection et la modification des situations de travail en vue de créer de meilleurs résultats. Ensuite, pour l'esprit d'équipe, Delaney et Huselid (1996) ont montré que la participation des employés aux activités d'une organisation et leur capacité à travailler en équipe sont toutes les deux nécessaires aux trois dimensions des comportements d'innovation au travail, par une meilleure capacité à créer,

partager et introduire de nouveaux services et de nouvelles idées. Pour ces raisons, les hypothèses de cette troisième étude ont également testé l'effet médiateur des compétences d'employabilité entre les activités d'apprentissage des enseignants (formelles et informelles sociales) et les comportements d'innovation au travail. Les analyses permettent de mettre en avant plusieurs résultats issus des données récoltées en ligne auprès des enseignants de primaire et de secondaire.

Trois conclusions principales ressortent de la réalisation d'une analyse de pistes causales (*path model*). Elles sont présentées dans les trois prochains paragraphes.

Premièrement, les compétences liées à l'employabilité peuvent être particulièrement améliorées par une diversité d'activités informelles d'apprentissage. Par contre, la mise en œuvre d'activités formelles d'apprentissage n'a de relation significative qu'avec les dimensions d'anticipation/optimisation. Cela est conforme aux recherches antérieures qui ont indiqué que les activités informelles d'apprentissage augmentent l'employabilité des employés dans les organisations à but lucratif et non lucratif (Froehlich et al., 2014). Par contre, de nombreuses dimensions des activités informelles d'apprentissage possèdent des relations significatives avec les compétences d'employabilité et les comportements d'innovation au travail. Concernant la relation significative entre l'utilisation que les enseignants font de l'aide reçue et l'anticipation/optimisation, cette relation ne se retrouve pas dans la littérature scientifique antérieure. En effet, Froehlich et ses collaborateurs (2014) ont constaté que l'apprentissage formel et informel influe significativement positivement sur l'anticipation et l'optimisation. Il est possible que, pour les enseignants, le recours à l'aide de quelqu'un puisse les empêcher de développer la capacité intérieure de trouver eux-mêmes des réponses et des solutions et de se préparer aux changements futurs dans leur travail. De plus, l'équipe de recherche de Froehlich a trouvé une relation significative positive entre la recherche d'aide et d'information, l'expertise et la flexibilité personnelle. Nous n'avons trouvé qu'une relation positive entre l'utilisation de l'information et l'expertise professionnelle, mais pas entre les autres dimensions de l'apprentissage social informel et l'expertise professionnelle. Ces différents résultats peuvent provenir de différences au sein du milieu professionnel. Les enseignants peuvent demander et utiliser l'aide d'une manière différente et pour d'autres raisons que le développement de leur expertise professionnelle. De plus, des relations positives et significatives ont aussi été observées entre les utilisations que font les enseignants des feedbacks et des informations qu'ils reçoivent et la compétence de flexibilité. En résumé, les six dimensions de l'apprentissage informel, et en particulier l'utilisation de l'information, possèdent des relations significatives avec au moins une des cinq compétences d'employabilité, et toutes ces compétences sont influencées par au moins une des six dimensions. Cela signifie pour les enseignants qu'entreprendre des activités informelles sociales d'apprentissage conduit à une meilleure amélioration des compétences d'employabilité qu'avec les activités formelles d'apprentissage. En outre, l'apprentissage informel social a montré de fortes relations significatives et directes avec deux des trois dimensions des comportements d'innovation au travail, alors que les activités formelles ne montrent pas de relations significatives sur le modèle de pistes causales. Une explication possible pourrait être que l'apprentissage formel offre des outils pour se préparer aux

changements futurs, mais qu'il n'encourage pas suffisamment les enseignants à sortir des sentiers battus. L'apprentissage social informel est alimenté par la motivation d'apprentissage et implique de la part des enseignants une certaine initiative personnelle, par la pensée innovante et son application. L'interaction avec les collègues peut également aider les enseignants à promouvoir les idées qu'ils ont eues et à trouver des moyens de les mettre en œuvre.

La deuxième conclusion principale met en avant l'importance de la distinction entre les différentes dimensions de l'apprentissage informel social, ainsi que la distinction entre sa fréquence et l'utilisation qui en est faite. Cette distinction se justifie par les impacts différents dont ces dimensions font preuve sur les compétences d'employabilité et les comportements d'innovation au travail. En particulier, la présence d'une meilleure utilisation que les enseignants font des informations qu'ils acquièrent socialement est liée à de plus hauts niveaux d'expertise, d'anticipation/optimisation, de flexibilité et d'esprit d'équipe. Elle influence également la génération et la réalisation des idées innovantes. La recherche d'informations est donc le moyen le plus efficace pour les enseignants, parmi ceux investigués, en vue d'améliorer leurs compétences d'employabilité et pour provoquer des comportements d'innovation au travail.

Enfin, troisièmement, l'hypothèse de l'effet médiateur de l'employabilité, entre l'apprentissage des enseignants et leurs comportements d'innovation au travail, se trouve partiellement vérifiée. Il peut donc être conclu que certaines compétences d'employabilité servent d'intermédiaire entre les activités (formelles et informelles) d'apprentissage et les comportements d'innovation au travail. Ces résultats vont dans le sens des recherches antérieures de la littérature, qui mettent en avant des liens entre ces variables sans spécifiquement mesurer les effets médiateurs des compétences d'employabilité (par ex. Gerken 2016 ; Murdoch-Eaton & Whittle, 2012). Pour illustrer ce propos, Gerken (2016) a rapporté avoir trouvé des relations positives et significatives entre les apprentissages (in)formels des employés et leurs compétences d'employabilité. Cette chercheuse montre également avoir trouvé de plus forts impacts des apprentissages informels sur l'employabilité, par rapport aux apprentissages formels. De même, elle a constaté des relations positives et significatives entre l'apprentissage informel et les comportements d'innovation au travail des employés. Enfin, elle suggère qu'une augmentation des compétences d'employabilité pourrait entrainer une augmentation des comportements d'innovation au travail. Cependant, les effets médiateurs des compétences d'employabilité n'ont pas été testés dans sa thèse.

2.3 Objectif 3- Mesurer le rôle du contexte pour l'apprentissage informel des enseignants

Après avoir décrit l'apprentissage informel des enseignants et ses effets sur leurs compétences professionnelles, le troisième objectif de cette thèse vise à étudier les relations existantes entre l'apprentissage informel des enseignants, en particulier sa dimension sociale, et le contexte scolaire dans lequel les enseignants travaillent, mesuré via le cadre conceptuel du climat d'apprentissage sur le lieu de travail.

De nombreuses études ont présenté des résultats suggérant ou prouvant qu'un climat d'apprentissage soutenant les comportements de feedbacks sur les pratiques et de collaboration est un élément important pour l'apprentissage informel des enseignants (par ex. Flores, 2004 ; Jurasaite-Harbison & Rex, 2010 ; Krečič & Grmek, 2008 ; Marsick & Volpe, 1999 ; Williams, Prestage, & Bedward, 2001). Sur la base de ces prémisses, la quatrième étude de cette thèse s'est penché sur la relation entre les différentes dimensions du climat d'apprentissage en milieu scolaire et celles de l'apprentissage informel social des enseignants, c'est-à-dire la fréquence et l'utilisation de trois activités d'apprentissage informel, à savoir la recherche de feedback, d'aide et d'informations. Les hypothèses de cette étude étaient que toutes les dimensions du climat d'apprentissage sont liées significativement aux six dimensions de l'apprentissage informel social des enseignants, positivement pour les dimensions du climat d'apprentissage de facilitation et d'appréciation et négativement pour la dimension d'évitement des erreurs. Au cours de l'analyse préliminaire, le nombre d'années d'expérience et le type de contrat des enseignants ont été mises en relation avec les autres variables de l'étude. Ces variables de contrôle ont mis en avant la présence de résultats inattendus et ont mené à l'ajout d'analyses de variance, afin de profiter de ces résultats pour peaufiner la discussion de cet article.

Les premiers résultats, calculés par un modèle d'équation structurelle, en tenant donc compte de l'existence des multicolinéarités entre les différentes variables indépendantes, ont montré que l'apprentissage informel social des enseignants, et en particulier l'usage que les enseignants font du feedback et de l'aide qu'ils reçoivent, est effectivement grandement déterminé par le climat scolaire d'apprentissage. Les trois dimensions du climat scolaire d'apprentissage permettent de prédire l'utilisation que les enseignants font de l'aide qu'ils reçoivent. De plus, les dimensions de facilitation et d'évitement des erreurs sont toutes les deux significativement liées à l'utilisation du feedback reçu. En d'autres termes, plus les enseignants d'une école considèrent leur climat de travail comme facilitant leurs activités d'apprentissage et tolérant envers les erreurs qu'ils pourraient faire, plus ils utilisent les feedbacks reçus dans leur pratique d'enseignants. Par contre, aucun effet de ce genre n'a été constaté vis-à-vis de la dimension d'appréciation des activités d'apprentissage. Cela pourrait s'expliquer par le fait que l'appréciation donnée aux enseignants comprend généralement un message d'encouragement mais sans composante d'évaluation ou de critique de ce qui se fait, ce qui ne permet pas de changer ses pratiques et donc, d'utiliser les éléments de feedbacks reçus par l'enseignant. En outre, plus le climat d'apprentissage de l'école est perçu comme facilitant et appréciatif des activités d'apprentissage, plus les enseignants utilisent dans leurs pratiques l'aide qu'ils reçoivent dans le cadre de leur travail. Ces résultats peuvent être liés aux recherches antérieures qui ont montré qu'un climat scolaire d'apprentissage favorable peut encourager et accroître à la fois l'aide et le partage de feedback entre enseignants (Jurasaite-Harbison & Rex, 2010 ; Marsick & Volpe, 1999). Le fait que l'école soit perçue comme plus tolérante vis-à-vis des erreurs incite également les enseignants à rechercher plus fréquemment des informations et de l'aide. Ces résultats rejoignent des recherches antérieures révélant qu'un climat de peur envers les erreurs peut rendre les employés réticents à apprendre (Edmonson, 1999) et que les comportements proactifs visant l'apprentissage peuvent se trouver entravés par un climat qui prévient la survenue d'erreurs (Lee et al., 2004).

Enfin, et contrairement aux hypothèses émises dans l'article, les résultats montrent qu'un climat d'apprentissage facilitant les comportements d'apprentissage que les enseignants pourraient faire ne semble pas accroitre la fréquence des activités informelles sociales d'apprentissage. Cela pourrait se justifier par le fait que l'utilisation faite des feedbacks, aides et informations a plus d'importance pour les apprentissages que la fréquence des activités d'apprentissage suivies. En d'autres termes, les résultats trouvés plaident pour la distinction entre la fréquence des activités informelles sociales d'apprentissage et l'utilisation qui est réellement faite des feedbacks, aides et informations reçues. Ensuite, et de nouveau à l'inverse des hypothèses émises, un climat scolaire d'apprentissage soutenant (selon les trois dimensions) n'aide pas les enseignants à faire une meilleure utilisation des informations qu'ils reçoivent dans le cadre de leur travail. Ce résultat peut être lié au fait que les informations reçues, contrairement au feedback par exemple, sont neutres et n'invitent pas toujours les enseignants à les mettre en action ou à les utiliser. En d'autres termes, le feedback contient surtout des retours évaluatifs visant à être utilisés alors que des informations, plus neutres, ne contiennent pas implicitement cette invitation.

Deuxièmement, et après les analyses complémentaires de variance, les résultats montrent aussi que les enseignants entreprennent moins d'activités d'apprentissage informel social (de recherche de feedback, d'aide et d'information) au fur et à mesure des années d'expérience. Cela va à l'encontre des résultats de Grosemans et ses collègues (2015), qui ont mis en avant que les enseignants plus expérimentés ne font statistiquement pas moins d'activités d'apprentissage que leurs collègues plus jeunes. Cependant, nos constatations pourraient indiquer que les enseignants expérimentés n'ont plus les mêmes besoins de perfectionnement et donc d'apprentissage que les enseignants débutants. Nous pouvons raccrocher ces résultats à ceux d'Ericsson (2009), qui montre que les professionnels ont besoin de 10 ans de pratique pour s'élever au rang d'experts de leur travail et à ceux de Geeraerts, Vanhoof et Van den Bossche (2018), qui ont trouvé que les enseignants plus âgés demandent moins de conseils et d'informations à leurs collègues au sujet des matières d'enseignement, de la gestion de classe ou des méthodes d'enseignement innovantes. Il est également possible que les enseignants expérimentés aient une meilleure connaissance d'eux-mêmes et soient également plus aptes à localiser les sources de savoirs efficaces pour leurs apprentissages, et donc entreprennent moins d'activités d'apprentissage, mais d'une façon plus efficaces.

Troisièmement, les analyses de variance ont également montré que le type de contrat dont dépendent les enseignants (temporaire, encore incertain, ou permanent, avec une nomination) influence l'usage que les enseignants font des feedbacks et des informations qu'ils reçoivent dans le cadre de leur travail. Plus précisément, des différences significatives sur la perception du climat d'apprentissage et les activités informelles sociales d'apprentissage entreprises ont été constatées entre le groupe des enseignants débutants sous contrat temporaire et celui des enseignants expérimentés avec un poste nommé par un contrat permanent. En effet, les enseignants débutants sous contrat temporaire perçoivent le climat d'apprentissage de leur école comme étant plus facilitant et gratifiant vis-à-vis des activités d'apprentissage et moins sévère envers les erreurs faites par les enseignants. Il est possible que les enseignants novices aient tout simplement une vision plus positive du climat scolaire d'apprentissage, ou que

différents sous-climats puissent coexister en fonction des différents groupes de collaboration des enseignants. Une étude de Geeraerts, Van den Boscche, Vanhoof et Moolenaar, faite en 2017, étaye cette explication en mettant en avant une certaine homophilie au sein de la cohorte des enseignants novices, pour leurs apprentissages. Les enseignants débutants ont tendance à discuter de leur travail et à collaborer davantage avec les autres enseignants novices, ce qui tend à démontrer l'existence de sous-climats d'apprentissage au sein des écoles.

3. Implications pratiques

La présente thèse et les chapitres qui la composent ont disséminé au fil des pages plusieurs implications concrètes sur la base des résultats trouvés. L'étude de l'apprentissage informel des enseignants et des activités par lesquelles il se développe a permis de mettre en évidence cinq principaux leviers d'actions à instaurer dans les écoles.

Premièrement, l'implication principale des études de cette thèse est que les activités informelles d'apprentissage des enseignants, et en particulier les activités sociales d'apprentissage, sont au centre de leur développement professionnel. Cela implique qu'il est important de sensibiliser les directions, les écoles et les décideurs politiques à l'importance de celles-ci. En effet, les études présentées remettent en question l'idée que les enseignants utilisent les activités formelles d'apprentissage comme principal moyen de développement professionnel. Ils disposent, au contraire, d'un large panel d'activités informelles d'apprentissage. Plus précisément selon les enseignants eux-mêmes, les activités informelles sociales d'apprentissage impliquant des collègues directs au sein d'une même école ou enseignant la même matière sont essentielles. Pour favoriser les échanges des connaissances et les collaborations entre collègues directs, les écoles peuvent œuvrer à mettre en place un environnement de travail soutenant et non compétitif, qui accueille les erreurs avec bienveillance dans une volonté d'apprentissage et qui permet aux doutes d'être discutés, sans jugement. Ces quelques jalons peuvent aider à transformer le travail des enseignants, souvent assez individuel, en travail porté par une équipe autogérée de collègues. Les enseignants passent de nombreuses heures seuls en classe, mais ils peuvent être soutenus dans leurs préparations, le débriefing de leurs cours, leurs idées d'amélioration et autres. Dans cette optique, il est essentiel de s'assurer qu'il y ait suffisamment de lieux d'échanges et d'entraide, physiques (salles de réunion, espaces de discussions en salle des professeurs, etc.) ou non (plateforme de documents en ligne, forum de discussions, etc.).

Deuxièmement, en sachant que les activités informelles sociales d'apprentissage sont liées à de meilleures compétences d'employabilité et davantage de comportements d'innovation au travail, il faut en particulier garder ce type d'activités et leurs spécificités à l'esprit dans le soutien des apprentissages des enseignants. De plus, il ne semble pas y avoir de différence entre les différents réseaux d'enseignement (officiel ou libre). Les résultats actuels ont montré que, des trois dimensions de l'apprentissage social informel concrétisées par Froehlich et al (2015), l'utilisation de l'information et la recherche de feedback sont les plus efficaces pour favoriser les compétences d'employabilité, et par effet indirect les

comportements d'innovation au travail. Or les compétences d'employabilité et les comportements d'innovation sont essentiels dans le métier d'enseignants. Pour rappel, Dirk van Damme (2014) et Sonia Guerriero (2017) mettent en avant le manque de compétences d'employabilité et d'innovation des enseignants européens pour affronter les défis du monde futur de l'éducation. En sus des implications pratiques déjà suggérées dans le paragraphe précédent, d'autres implications peuvent se développer sur le versant social des activités informelles d'apprentissage. Par exemple, un système de mentorat peut s'organiser entre des enseignants plus expérimentés et des enseignants plus jeunes, pour viser le renforcement des échanges de feedbacks, d'aides et d'informations. Une autre idée serait de développer des groupes de travail par matière ou par difficultés spécifiques. Cependant, accroître la collaboration entre enseignants n'est pas le seul moyen de favoriser l'apprentissage informel social. En effet, le personnel non enseignant de l'école ou les personnes extérieures à celle-ci peuvent également s'avérer utiles. Par exemple, un psychologue scolaire peut donner des éléments de feedback utiles à un enseignant au sujet d'une situation de classe, ou encore un ami comédien peut donner des renseignements précieux sur l'attitude à adopter devant un groupe. Enfin, la famille et les amis peuvent aussi donner des idées, des commentaires ou des conseils.

Troisièmement, il est important de sensibiliser les écoles et leur direction à l'importance du climat d'apprentissage pour le développement professionnel des enseignants sur leur lieu de travail. Parmi les dimensions du climat d'apprentissage, le fait de favoriser et de faciliter la mise en place d'activités d'apprentissage et le fait de laisser la place aux erreurs, sans vouloir les éviter à tout prix sont les deux principaux points d'attention. Il faut donc s'atteler à mettre en place un climat d'apprentissage qui autorise les erreurs, vues comme utiles pour l'apprentissage, et facilitent les activités d'apprentissage en laissant un accès facile aux ressources pédagogiques et aux collègues. Par exemple, les directions d'école peuvent améliorer leur climat scolaire d'apprentissage en créant une plateforme de partage en ligne, en parlant des expériences et des idées en réunions, en créant des espaces accueillants de communauté et de discussions. De plus, la politique de gestion de leurs erreurs peut aider les enseignants à oser faire des expériences et à tirer des leçons de leurs essais manqués.

Quatrièmement, une partie des résultats de cette thèse soutiennent que les comportements d'innovation au travail des enseignants peuvent être soutenus et développés au sein des écoles. La création, la promotion et la réalisation d'idées innovantes sont liées aux activités informelles sociales d'apprentissage, en partie médiées par plusieurs compétences d'employabilité des enseignants. Cela va dans le sens de recherches précédentes (par ex. Bonami & Garant, 1996 ; Letor & Périsset-Bagnoud, 2010) montrant qu'un travail collectif d'enseignants était très souvent présent lors de l'émergence et de la mise en place d'innovations dans une école. Cependant, Dupriez (2015) met en avant la faiblesse de la régulation interprofessionnelle due en grande partie à une grande autonomie individuelle des enseignants et la diversité des objectifs de chacun d'entre eux. Cette faible régulation rend difficile la supervision du travail de chacun et l'apport d'innovations par la direction de l'école. Ces innovations sous formes de réformes se heurtent en effet à de grandes résistances à cause de la structure peu articulées des cellules-classes, relativement autonomes et dont le

travail est parfois découplé du projet et des objectifs de l'établissement (Tardif & Lessard, 1999 ; Weick, 1976). Selon Collie, Shapka et Perry (2012), ces raisons peuvent expliquer pourquoi les innovations éducatives et les réformes scolaires, même celles dont les objectifs sont partagés par les enseignants et devraient favoriser des résultats positifs à long terme à la fois pour les élèves et les enseignants, ont souvent de grandes difficultés à être mises en place à court terme. À l'inverse, et grâce à l'autonomie dont les cellules-classes et les enseignants bénéficient, les innovations imaginées par ces derniers et venant du terrain sont bien plus faciles à mettre en place (Dupriez, 2015). Nous conseillons donc aux directions et aux politiques de l'enseignement de ne pas chercher à implémenter trop d'innovations scolaires mais d'examiner comment permettre et soutenir l'émergence, le partage et la mise en place d'innovations par les enseignants, pour les enseignants et les élèves (Collie, Shapka, & Perry, 2012). Ce soutien peut se faire principalement de deux manières. Premièrement, l'école peut mettre à disposition des enseignants et en fonction des projets quelques ressources logistiques, physiques, financières ou même en termes de temps de travail disponibles. Deuxièmement, par un accueil positif envers les projets d'enseignants, une école peut instaurer un climat de coopération et de partage soutenant pour les changements et les évolutions des pratiques enseignantes.

Enfin, en mettant en rapport les résultats des recherches susmentionnées et les études présentes dans la littérature (par ex, Hirst et al., 2009), il faut mentionner que les activités formelles d'apprentissage trouvent elles aussi une utilité dans le développement professionnel des enseignants. Les enseignants utilisent les formations de type formel principalement pour augmenter leurs capacités d'anticipation et d'optimisation, pour des situations futures. À l'inverse, les activités informelles d'apprentissage semblent plus efficaces pour améliorer l'expertise, la flexibilité et les innovations des enseignants. De plus, elles semblent moins coûteuses à mettre en place, principalement par de petits changements (par exemple, par l'aménagement d'un coin de discussion dans la salle des professeurs ou en programmant une réunion d'équipe juste après le repas). Ces activités informelles donnent aux enseignants le contrôle de leur apprentissage et leur permet de travailler efficacement sur leurs besoins spécifiques d'apprentissage. Cependant, il serait délétère de supprimer les formations formelles. Cette thèse défend principalement un soutien et un développement des activités informelles d'apprentissage afin de permettre aux enseignants de développer les compétences et les outils pour les défis de la profession d'enseignant au sein de l'école de demain.

Concrètement, à chaque direction d'école, les implications pratiques de cette thèse proposent d'être en première ligne dans la réponse aux besoins de développement professionnel des enseignants. La première étape consiste à être des leaders d'école en œuvrant à des climats scolaires soutenant à la fois les apprentissages et les innovations. Ce climat peut être mis en place par une tolérance aux erreurs, des incitations aux débriefings, au partage, à l'entraide et à la collaboration. Cela peut être fait en créant de la place pour des lieux et des moments d'échanges entre enseignants ou en laissant des ressources à disposition. Les endroits d'échange peuvent être physiques comme informatiques. Des groupes de travail sur des sujets spécifiques peuvent également être mis en place, sur participation libre de ceux

qui pensent en bénéficier. Ensuite un suivi formatif, comprenant des rencontres, des évaluations formatives et des feedbacks, peut aussi être assuré envers les enseignants pour les accompagner dans leur développement professionnel et leur montrer les domaines dans lesquels ils ont les plus grandes marges d'amélioration. Ces pistes d'amélioration peuvent comprendre des formations formelles, mais aussi des collaborations entre collègues ou des recherches individuelles.

Pour les décideurs politiques, cette thèse met en avant plusieurs sujets de réflexion. Premièrement, elle questionne le rôle de la nomination des enseignants sur la continuité de leur développement professionnel. Dans cette optique, sans tirer de conclusion hâtive, elle suggère qu'une réflexion sur la nomination des enseignants et ce qu'il en découle peut être intéressante. Deuxièmement, elle s'appuie sur des résultats scientifiques pour valoriser les activités informelles d'apprentissage, et en particulier leur dimension sociale. Or ces activités d'apprentissage n'ont actuellement aucune reconnaissance dans la formation continue des enseignants. De plus, de nombreux enseignants interrogés lors d'entretiens individuels ont été assez critiques sur le dispositif de journées pédagogiques et de formations formelles. Dans la lignée de cette réflexion et sans vouloir les supprimer, cette thèse suggère une reconnaissance et une valorisation des activités plus informelles d'apprentissage.

4. Limites de la thèse

Tout au long de ce travail doctoral, plusieurs limites sont apparues de manière transversale, en fonction des choix méthodologiques et des réalisations pratiques. Celles-ci sont explicitées ci-après. Plus loin dans cette thèse, et en réaction à ces limites, des pistes futures de recherche sont présentées.

4.1 Généralisation des résultats

La généralisation des résultats de recherche, appelée validité externe, permet de savoir si les résultats d'une étude peuvent être légitimement rapportés et appliqués à une population plus large (McTavish & Loether, 2002), ou à d'autres moments et dans d'autres groupes de personnes (Monette, Sullivan, & DeJong, 2002). Cette généralisation peut se penser dès la conception du design des études (Drummond, Manca, & Sculpher, 2005). Afin de faciliter la généralisation, les études présentées ici ont visé à collecter de vastes échantillons d'enseignants, à la fois en primaire et en secondaire, sans distinction de matières enseignées. De plus, les différentes approches multi-sources ont permis d'avoir une compréhension la plus complète et globale des phénomènes en place auprès de l'ensemble des enseignants de Belgique francophone. Dans les études de cette thèse, les concepts et les relations entre variables ont été testés en utilisant des échantillons issus des cinq provinces de Wallonie, ainsi que de Bruxelles. De plus, afin de faciliter la généralisation des résultats, les sélections de participants dans chaque étude se sont faites aléatoirement et les variables démographiques (genre, âge, niveau d'enseignement, etc.) ont été vérifiées. Cependant, les résultats reflètent de phénomènes partagés et globaux. Ils ne peuvent pas refléter les différentes spécificités des écoles et des enseignants. Les résultats présentés dans cette thèse sont assez fortement

généralisables à l'ensemble du corps enseignant de primaire et secondaire en Belgique francophone. En outre, étant donné l'utilisation fréquente d'articles d'autres pays comme supports théoriques, généralement vérifiés, les résultats présentés sont moyennement généralisables auprès des enseignants d'autres systèmes éducatifs. Pour en augmenter la généralisation, il serait bon de répliquer ces études dans différents systèmes éducatifs pour en éprouver les résultats au sein d'autres contextes. Enfin, ces résultats sont peu généralisables auprès d'autres professions et d'autres secteurs d'activités.

4.2 Mesures auto-rapportées

Les entretiens et les questionnaires utilisés durant ce travail doctoral sont basés sur les avis auto-rapportés des enseignants en ce qui concerne leurs pratiques et impressions. La prise de mesures auto-rapportées est peu coûteuse en temps et en énergie et constitue la source d'information et de mesures la plus utilisée pour mesurer l'apprentissage informel des enseignants (Kyndt et al., 2016). Cependant, Enos, Kehrhahn et Bell (2003), dans un contexte d'apprentissage informel, soulignent que les mesures auto-rapportées ont leurs limites et peuvent être considérées comme des écueils relatif et modérés de l'exactitude des résultats, causé par les biais d'interprétation et d'auto-distorsion des participants. Ils ajoutent que ces écueils sont minimisés dans les cas où l'étude ne menace pas directement les participants.

Dans cette optique, les recherches futures pourraient diversifier les sources de mesures et éviter au maximum les biais issus des mesures auto-rapportées. Cela pourrait être fait par observation dans l'école, ou encre en questionnant, en plus des enseignants, leurs collègues ou la direction afin d'agréger les informations de plusieurs personnes et de minimiser les biais. D'autres possibilités, comme rapportées dans le chapitre deux, peuvent aussi être utilisées pour arriver à saisir le plus complètement l'apprentissage informel des enseignants, notamment en tenant compte de la dimension sociale et du contexte. Les exemples donnés précédemment sont les badges sociométriques et l'analyse des réseaux sociaux. Les badges sociométriques sont de petits dispositifs que portent les enseignants sur eux et qui mesure les déplacements, la proximité et le temps de discussion (Kim, McFee, Olguin, Waber, & Pentland, 2012). L'analyse des réseaux sociaux est, quant à elle, une méthode systématique de cartographie du réseau social des enseignants pour en tirer les caractéristiques pertinentes (Carrington, Scott, & Wasserman, 2005 ; Coburn & Russell, 2008).

4.3 Participations volontaires

Dans les trois études empiriques présentées dans la présente thèse, tous les enseignants interrogés ont participé sur base volontaire au projet de recherche. Compte tenu de cette participation volontaire, il est possible que les participants aient un meilleur engagement dans les activités d'apprentissage en milieu de travail, en comparaison avec leurs collègues n'ayant pas désiré participer. Selon Flores (2004) mais aussi Lohman et Woolf (2001), les écoles dans lesquelles les enseignants apprennent moins et se développent moins professionnellement ne participent généralement pas à ce genre de recherche. Des recherches futures pourraient éviter ces biais de sélection potentiels soit en choisissant aléatoirement des

enseignants dans des écoles tirées au sort soit en choisissant des échantillons représentatifs et en essayant d'augmenter le taux de réponse du groupe d'enseignants choisi.

4.4 Confusion des niveaux d'enseignement

Dans ce travail doctoral, la revue de littérature s'est penchée sur l'ensemble des niveaux d'enseignement, depuis les années de maternelles jusqu'aux études supérieures. Ensuite, une fois le concept général fixé, pour chacune des trois études empiriques, la recherche s'est concentrée sur les enseignants des écoles primaires et secondaires. Toutefois, malgré les similitudes relevées dans ces études, il existe de nombreuses différences entre les enseignants du niveau primaire et celui du niveau secondaire, par exemple dans leurs horaires, leurs tâches quotidiennes ou encore les matières qu'ils enseignent. En effet, les enseignants « ordinaires » des écoles primaires gèrent différentes matières scolaires (en excluant en général les langues étrangères, l'éducation sportive et la religion/morale), n'ont en général qu'une seule salle de classe et un seul groupe d'élève. Les enseignants des écoles secondaires, mais aussi les professeurs de langues et d'éducation sportive de primaire, sont experts d'une ou plusieurs matières spécifiques et changent régulièrement de groupe-classe. Les enseignants des deux niveaux ne partagent pas non plus les mêmes compétences de gestion de classe, interpersonnelles et autres. De plus, leurs élèves ont des capacités différentes et ont d'autres spécificités liées à leur âge (par ex. Tardif, Lessard, & Lahaye, 1991). Dans cette optique, maintenant que les activités informelles d'apprentissage des enseignants du primaire et du secondaire ont été décrites et étudiées, de futures recherches peuvent apporter de la nuance dans nos résultats et investiguer en profondeur les différents phénomènes en œuvre dans les différents niveaux d'enseignements, au niveau de l'apprentissage informel des enseignants.

5. Que retenir ?

En conclusion, ce travail de thèse montre que, si tous les apprentissages des enseignants des écoles primaires et secondaires sont bénéfiques, les activités informelles d'apprentissage semblent plus efficaces pour soutenir l'apprentissage des enseignants sur leur lieu de travail, en particulier lorsqu'elles impliquent des collègues directs ou d'autres personnes. Cependant, l'utilisation systématique des mesures auto-rapportées pour l'étude des apprentissages des enseignants constitue une limite des résultats présentés, qui pourrait être dépassée lors de futures recherches.

Cette thèse a permis de proposer une définition unifiée de l'apprentissage informel des enseignants sur la base de celles présentes dans la littérature, d'explorer le sens que les enseignants accordaient à ce type d'apprentissage ainsi que des relations qu'il entretient avec, d'une part, le climat d'apprentissage et, d'autre part, les compétences d'employabilité et les comportements d'innovation au travail. Ces perspectives ont été rassemblées dans ce travail de thèse et liées par des objectifs complémentaires et suivis.

Les activités informelles d'apprentissages des enseignants permettent de soutenir efficacement leur apprentissage professionnel. Ce travail de thèse a cherché à les définir, en comprendre la réalité sociale, étudier ses effets et chercher à les soutenir, par le climat scolaire

d'apprentissage. Une approche inductive et une autre hypothético-déductive ont été combinées via des méthodes qualitatives et quantitatives pour arriver à ce but.

6. Et ensuite ? Orientation pour de futures recherches

Suite aux travaux de recherche présentés dans cette thèse, d'autres recherches peuvent à la fois renforcer les preuves empiriques de l'apprentissage informel des enseignants et repousser les frontières de son cadre théorique. Parmi ces pistes de recherches futures, trois axes principaux de recherche sont développés dans les lignes qui suivent, à savoir :

- Une analyse des réseaux professionnels et extraprofessionnels d'échanges de feedback, d'aide et d'information des enseignants.
- Une analyse poussée des différents contenus des apprentissages des enseignants et de leurs impacts sur leurs actions professionnelles.
- La prise en compte des aspects contextuels de l'apprentissage dans la vie quotidienne professionnelle des enseignants.

6.1 Réseaux d'échanges et d'apprentissage

À l'avenir, de futures recherches pourraient permettre d'élargir les conclusions de cette thèse sur le sujet des réseaux et des groupes aux seins desquels les enseignants apprennent. Premièrement, le réseau d'apprentissage professionnel et les différentes personnes au sein de l'école à l'origine des apprentissages informels des enseignants n'ont presque pas été détaillés. Les études présentes dans cette thèse se penchent sur la fréquence et l'utilisation faite des activités informelles d'apprentissage des enseignants mais n'investiguent pas les personnes particulières à l'origine des apprentissages. Des futures recherches pourraient étudier les raisons pour lesquelles certains collègues partagent davantage entre eux et les affinités d'activités d'apprentissage entre collègues. Deuxièmement, les réseaux d'apprentissage extérieurs n'ont que très peu été investigués également. Dans cette thèse, les études se sont concentrées sur l'apprentissage social des enseignants, et principalement sur les apprentissages informels issus de leurs collègues et de la direction. La principale raison de ce choix est que l'équipe de direction et les collègues enseignants côtoient quotidiennement les participants des études de cette thèse et sont plus familiers de leur travail quotidien. En conséquence, ce sont les personnes les plus susceptibles de fournir des feedbacks, de l'aide et des informations quotidiennement sur le travail des enseignants. Cependant le personnel non-enseignant de l'école, comme les éducateurs ou les membres des centres PMS, et les personnes extérieures à l'école, comme les amis ou la famille des enseignants, peuvent eux-aussi être une source importante et précieuse d'apprentissage. Par exemple, des amis pratiquant d'autres métiers peuvent apporter des suggestions pour les cours ou donner leurs avis au sujet des pratiques enseignantes. C'est une des conclusions du troisième chapitre de cette thèse qui n'a pas été développée dans les chapitres suivants. Les savoirs, savoir-être et savoir-faire appris en dehors du cadre professionnel peuvent tout à fait être généralisés dans les pratiques enseignantes. Les recherches futures pourraient se pencher sur l'ensemble des personnes qui permettent aux enseignants d'apprendre informellement et sur leurs rôles distincts, en dépassant l'homophilie des enseignants.

6.2 Contenus des apprentissages

De nouvelles pistes de recherche pourraient également porter sur les contenus des apprentissages informels et en particulier lors des échanges de feedbacks, d'aide et d'informations des enseignants. Le chapitre trois de cette thèse a montré que les enseignants rapportent avoir des apprentissages basés sur leurs attitudes avec les élèves, sur leurs expertises de matière, sur leurs façons de préparer et de donner cours ou encore sur les évaluations. Cependant, ils ne précisent que rarement le contenu précis de leurs apprentissages. Les futures recherches pourraient spécifier les contenus des apprentissages des enseignants et les lier d'une part aux stimuli qui les ont provoqués et d'autre part aux personnes par lesquelles ces apprentissages ont été apportés le cas échéant. De plus, dans l'optique de favoriser les échanges et d'optimiser une partie des apprentissages informels des enseignants, des interventions pourraient être développées dans les écoles, basées sur les types d'échanges et les sujets jugés par les enseignants comme les plus importants dans leurs pratiques professionnelles.

6.3 Activités d'apprentissages non sociales

Cette thèse se concentre sur la composante sociale essentielle des apprentissages informels, en particulier dans les chapitres quatre et cinq de cette thèse. Cela a été fait en grande partie parce que des recherches antérieures ont souligné l'importance de celles-ci (par ex. Rosette et al., 2015). Cependant, à l'avenir l'importance des influences non sociales pourrait aussi être étudiée puisqu'une partie des activités d'apprentissages des enseignants a lieu sans composante sociale. En effet, malgré la grande importance des activités sociales d'apprentissage, les autres activités sont elles aussi à investiguer davantage. De futures recherches pourraient étudier ces activités d'apprentissage ainsi que leurs antécédents et leurs liens avec les compétences d'employabilité et les comportements d'innovation des enseignants.

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Appendices

Appendix A
Critical appraisal of the qualitative articles from the literature review

Appendix A: Critical appraisal of the qualitative articles from the literature review

Author(s)	Did the study clearly state the aim of the research?	Did the study choose an appropriate qualitative methodology?	Did the study choose the appropriate research design to address the aim of the research?	Did the study use an appropriate recruitment strategy to address the aim of the research?	Did the study collect the data in such a way that it addressed the research issue/aim?	Did the study adequately consider the relationship between researcher and participant(s)?	Did the study consider ethical issues?	Did the study do a sufficiently rigorous data analysis?	Does the study present a clear statement of findings?	Final Rating
Aown (2011)	Y	Y	Y	Y	Y	Y	N	Y	Y	High
Collinson & Cook (2004)	Y	Y	Y	Y	Y	Y	N	Y	Y	High
Davis (2015)	Y	Y	Y	Y	Y	N	Y	Y	Y	High
Hanraets, Hulsebosch, & De Laat (2011)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Harrison & McKeon (2008)	Y	Y	Y	N	Y	N	N	Y	Y	Medium
Henze et al. (2009)	Y	Y	Y	Y	Y	Y	N	Y	Y	High
Hoekstra et al. (2007)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Hoekstra, Korthagen et al. (2009)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Hoekstra & Korthagen (2011)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Jones & Dexter (2014)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Jurasaite-Harbison (2009)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Kang & Cheng (2014)	Y	Y	Y	Y	Y	Y	N	Y	Y	High
Knight et al. (2006)	N	Y	Y	N	Y	N	N	N	Y	Medium
Lohman (2000)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Lohman (2003)	Y	Y	Y	Y	Y	N	N	Y	Y	High
McPherson, Budge, & Lemon (2015)	N	Y	N	N	Y	N	N	N	N	Low

Rashid (2018)	Y	Y	Y	Y	Y	N	Y	Y	Y	High
Schei & Nerbø (2015)	Y	Y	Y	Y	Y	N	Y	Y	Y	High
Schreurs et al. (2016)	Y	Y	Y	Y	Y	N	Y	Y	Y	High
Tarc (2007)	Y	Y	Y	N	Y	N	N	Y	Y	Medium
Thacker (2015)	Y	Y	Y	Y	Y	N	N	Y	Y	High
Thomson (2015)	Y	Y	Y	Y	Y	N	Y	Y	Y	High
Thomson & Trigwell (2016)	Y	Y	Y	N	Y	N	N	Y	Y	Medium
Van Eekelen, et al. (2005)	Y	Y	Y	Y	Y	Y	N	Y	Y	High
Van Lankveld et al (2016)	Y	Y	Y	Y	Y	Y	N	Y	Y	High
Viskovic (2005)	Y	Y	Y	N	Y	N	N	Y	Y	Medium

Abbreviations: Y (Yes), N (No)
Criteria met: < 4 Low
Criteria met: 4 - 6 Medium
Criteria met: > 6 High

Appendix B
Critical appraisal of the quantitative articles from the literature review

Appendix B: Critical appraisal of the quantitative articles from the literature review

Author(s)	Did the study clearly state the aim of the research?	Did the study choose an appropriate quantitative methodology?	Did the study use an appropriate recruitment strategy to address the aim of the research?	Did the study make use appropriate sampling and sample?*	Did the study justify the measurements (validity and standards)?*	Did the study control for confounding variables?*	Did the study clearly state the findings?	Did the study produce results that are generalizable to the source population?	Rating
Gerken et al. 2016)	Y	Y	Y	Y	Y	Y	Y	Y	High
Hoekstra, Brekelmans et al. (2009)	Y	Y	Y	Y	Y	Y	Y	Y	High
Van der Klink et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	High
Krauss & Guat (2008)	Y	N	Y	N	Y	N	Y	Y	Medium
Lecat, Beausaert, & Raemdonck (2018)	Y	Y	Y	N	Y	N	Y	N	Medium
Lohman (2005)	Y	Y	Y	Y	Y	Y	Y	Y	High
Lohman (2006)	Y	Y	Y	Y	Y	Y	Y	Y	High
Rehm & Notten (2016)	Y	N	Y	N	N	N	Y	Y	Medium
Reichenberg & Andreassen (2018)	Y	Y	Y	Y	Y	N	Y	Y	High
Richter et al. (2011)	Y	Y	Y	Y	Y	Y	Y	Y	High
Springer (2016)	Y	N	Y	Y	N	N	Y	Y	Medium

Abbreviations: Y (Yes), N (No)
Criteria met: < 4 Low
Criteria met: 4 - 5 Medium
Criteria met: > 5 High
* Extra criteria based on the study by Puye et al. (2009)

Appendix C
Critical appraisal of the mixed method articles from the literature review

Appendix C: Critical appraisal of the mixed study articles from the literature review

Author(s)	Did the study clearly state the aim of the research?	Did the study justify the use of a mixed-method design*?	Did the study use a combination of qualitative and quantitative data collection-analysis techniques or procedures?	Did the study use an appropriate recruitment strategy to address the aim of the research?	Did the study collect the data in such a way that it addressed the research issue/aim?	Did the study adequately consider the relationship between researcher and participant(s)?	Did the study consider ethical issues?	Did the study do a sufficiently rigorous data analysis?	Did the study integrate the qualitative and quantitative data or results*?	Did the study clearly state the findings?	Rating
Bakkenes et al. (2009)	Y	N	Y	Y	Y	N	N	Y	Y	Y	High
Flores (2005)	Y	N	Y	Y	Y	N	N	Y	Y	Y	Medium
Grosemans et al. (2015)	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	High
Kwakman (2003)	Y	N	Y	Y	Y	N	N	Y	Y	Y	Medium
Pifer et al. (2015)	Y	N	Y	Y	Y	N	N	Y	Y	Y	Medium

Abbreviations: Y (Yes), N (No)
Criteria met: < 4 low
Criteria met: 4 -5 medium
Criteria met: > 6 high
* Extra criteria based on the study by Puye et al. (2009)

Appendix D
Characteristics of selected studies from the literature review (part 1)

Appendix D: Characteristics of selected studies from the literature review (part 1)

Author	Publication Year	Journal	Country	Participants	Level of Education	Level of Experience	Study type
Aown	2011	Teacher and Teacher Education	USA, Michigan	One Non-Muslim teacher	2	E	Qualitative
Bakkenes, Vermunt, & Wubbels	2009	Learning and Instruction	The Netherlands	94 participants	2	E (3 - 15 years)	Mixed-Method
Collinson	2004	Educational Administration	US	10 participants from 3 schools	2	E (between 5 and 28 year experience)	Qualitative
Davis	2015	Disability and Rehabilitation	USA	19 Interview and Twitter data participants (11 female, 8 male)	1 and 2	E (17/19 have 6+ years teaching experience)	Qualitative
Flores	2005	In-service Education	Portugal	14 new teachers	1 and 2	Sample of E (42 percent) and I (31 percent)	Mixed-Method
Gerken, Beausaert, & Sergers	2016	Human Resource Development International	The Netherlands	209 participants (86 male; 123 female)	3	Sample of I and E (7percent <1; 35 percent 1 - 5; 22 percent: > 20	Quantitative
Grosemans, Boon, Verclairen, Dochy, & Kyndt	2015	Teaching and Teacher Education	Belgium	18 teachers for the interviews, 44 participants for the questionnaire	1	Sample of I (15 ≤ 5 years experience) and E (5 > 47 participants < 37 years experience)	Mixed-Method
Hanraets, Hulsebosch, & De Laat	2011	Educational Media International	The Netherlands	8 participants	1, 2, and 3	I (8 > 1 year)	Qualitative
Harrison & McKeon	2008	European Journal of Teacher Education	Various countries across Europe, Israel, USA	5 beginning teacher educators	3	E (1 = 3 years experience, 10 > 4 participants < 25 years experience)	Qualitative
Henze, Van Driel, & Verloop	2009	Journal of Teacher Education	The Netherlands	8 science teachers	2	E	Qualitative
Hoekstra, Beijaard, Brekelmans, & Korthagen	2007	Teacher and Teaching: Theory and Practice	The Netherlands	4 participants	2	E (2 participants = 7 years of experience; 2 between 20	Qualitative

						and 22 years of experience)	
Hoekstra, Korthagen, Brekelmans, Beijaard & Imants	2009	Journal of Workplace Learning	The Netherlands	32 teachers (out of which in-depth analysis of 1 male and 1 female teacher)	2	E (7 and 9 years teaching experience)	Mixed-Method (with embedded design)
Hoekstra, Brekelmans, Beijaard & Korthagen	2009	Journal of Teaching and Teacher Education	The Netherlands	32 teachers	2	E (minimum of 5 years teaching experience)	Quantitative
Hoekstra & Korthagen	2011	Journal of Teacher Education	The Netherlands	32 teachers	2	E	Mixed-Method
Jones & Dexter	2014	Education Tech Research Development	USA	36 math and science teachers	2	I (6 between 1 and 5 years experience and E (30 > 5 years experience)	Qualitative
Jurasaite-Harbinson	2009	Journal of Workplace Learning	USA and Lithuania	11 teachers - 3 schools	1	X	Qualitative
Kang & Cheng	2014	Language Teaching Research	Beijing, China	1 participant	2	I (6 months of teaching experience)	Qualitative
Klink, Van der Heijden, Boon, & Williams van Rooij	2014	Career Development International	The Netherlands	139 academic staff members (74 men; 65 women) at Open University	3	E (Average tenure was 10 years)	Quantitative
Krauss & Guat	2008	Human Resource Development International	Malaysia	86 beginning teachers [27m/59f]	X	I (between 3 and 10 months of experience)	Quantitative
Knight, Tait, & Yorke	2006	Studies in Higher Education	United Kingdom	2401 part-time teachers, online responses from 248 full-time staff	3	X	Qualitative
Kwakman	2003	Teaching and Teacher Education	The Netherlands	542 teachers for survey - 10 schools and 16 teachers for open interviews	2	E (Survey participants mean experience 20.1 years) and E (open intervies experience between 6 and 33 years)	Mixed-Method
Lecat, Beausaert & Raemdonck	2018	Vocations and Learning	Belgium	301 teachers	1 and 2	I and E (between 1 and 39 years of experience)	Quantitative
Lohman	2000	Adult Education Quarterly	Iowa, USA	22 participants from 10 schools	1 and 2	E (> 3 years teaching experience)	Qualitative
Lohman	2003	Performance Improvement Quarterly	Iowa, USA	22 participants from (16 elementary schools, 4 high schools)	1 and 2	E (> 3 years teaching experience)	Qualitative
Lohman	2005	Human Resource Development Quarterly	USA	318 participants (n = 166 teachers)	1 (n=95), 2 (n=68), and 3 (n=1)	X	Quantitative
Lohman	2006	Journal of Workplace Learning	USA	166 teachers	1 (n=95) and 2 (n=68) [1 unknown]	I (n = 28 < 5 years)) and E (n = 138 > 5 years experience)	Quantitative
Pifer, Baker, & Lunsford	2015	International Journal for	USA	541 participants	3	X	Mixed-Method

Rashid	2018	Academic Development Reflective Practice	Malaysia	(35 percent professors) 34 participants	2	X	Qualitative
Rehm & Notten	2016	Teaching and Teacher Education	Germany	4196 Teacher Twitter Users	X	X	Quantitative
Reichenberg & Andreassen	2018	Reading Psycology	Sweden and Norway	Swedisch (n=340) and Norwegian (n=236) teachers	2	I and E (between 3 months and 44 years teaching experience)	Quantitative
Richter, Kunter, Klusmann, Lüdtke, & Baumert	2011	Teaching and Teacher Education	Germany	1939 teachers (from 198 schools)	2	E (1 - 44 years)	Quantitative
Schei & Nerbø	2015	Human Resource Development Quarterly	Norway	10 participants (6 assistants and 4 teachers)	0	E (all teachers experience between 2 - 8 years)	Qualitative
Schreurs, Huvenees, & Dolmans	2016	Medical Teacher	The Netherlands	23 teachers (10 women, 13 men)	3	E (experience ranged from 2 - 20 years or <85)	Qualitative
Springer	2016	International Journal of Music Education	USA	69 respondents (of which 95.7 percent taught music)	2 and 3	E (1 - 44 years)	Quantitative
Tarc	2007	The Canadian Journal for the Study of Adult Education	Canada	X*	1 and 2	X	Mixed-Method
Thacker	2015	Journal of Social Studies Research	USA	12 teachers	2	E (2 - 27 years experience)	Qualitative
Thomson	2015	International Journal for Academic Development	Australia	30 academics	3	I and E	Qualitative
Thomson & Trigwell	2016	Studies in Higher Education	Australia	24 participants	3	E (2 and 20 years experience)	Qualitative
Van Eekelen, Boshuizen & Vermunt	2005	Higher Education	The Netherlands	15 college teachers from 2 colleges	3	E	Qualitative
Van Lankveld, Schoonenboom, Kusurkar, Beishuizen, Croiset & Volman	2016	BMC Medical Education	The Netherlands	19 tutors (teacher communities) and 9 (interviews)	3	I and E	Qualitative
Viskovic	2005	Journal of Vocational Education and Training	New Zealand	12 teachers	3	E	Qualitative
Wilson & Demetriou	2007	The Curriculum Journal	UK	10 teachers	2	I (between 0 and 2 years experience)	Qualitative

Level of Education: Kindergarten (0), Primary School (1), Secondary Education (2), Tertiary Education (3)
Level of Experience: Inexperienced [I], Experienced [E], Not Clear (X)
X indicated that the study did not mention the criterion

Appendix E
Characteristics of selected studies from the literature review (part 2)

Appendix E: Characteristics of selected studies from the literature review (part 2)

Author	Publication Year	Methodology	Analysis	Research Questions or Aim of the study
Aown	2011	Single Case Study	Narrative and Reflective , grounded theory	1) How did the experienced teacher come to her interest in the learning about religion? 2) What learning activities did the experienced teacher report to have engaged in during her learning about Islam 3) What learning outcomes did the experienced teacher report to have resulted from her learning activities
Bakkenes, Vermunt, & Wubbels	2009	Digital Logs every 6 weeks over the course of one year	Inter-rater liability and content analysis + Chi-square and cross-tabulation	Contribute to a conceptual framework on teacher learning by exploring secondary school teachers' learning activities and learning outcomes in the context of educational innovation
Collinson	2004	Pre-interview survey; semi-structured interviews; post-interview survey	Inductive and iterative analysis; transcribed, coded, and categorized; Force-field analysis	Represent an initial step in examining the interplay between individual and organisational learning in a school context, specifically focusing on factors that motivated and restrained the dissemination of teachers' learning in three schools involved in a multi-year computer technology innovation project
Davis	2015	Embedded Case Study with three data sources. 1) archived data (Tweets from 2011) 2) Interviews 3) Tweet data from participants	Content Analysis	How do school teachers in the United States (US) perceive using Twitter as a means for professional development, engagement in communities of practice, and any benefits or drawbacks to participating in Twitter.
Flores	2005	Semi-structured interviews and questionnaires over the course of two years	Vertical analysis followed by a horizontal/comparative analysis (cross-case analysis)	Examine teacher learning in the workplace, and its implications for promoting meaningful opportunities for teachers' professional development throughout their careers
Gerken, Beausaert, & Sergers	2016	Online survey and open-ended question(s)	Descriptive analysis; multivariate multiple regression analysis; correlational analysis	How do social informal learning and formal learning activities of faculty staff relate to their employability in terms of occupational expertise, anticipation and optimization, and personal flexibility?
Grosemans, Boon, Verclairen, Dochy, & Kyndt	2015	Semi-structured interviews and questionnaire	Deductive and inductive analysis; reliability of scales; descriptive statistics and correlations between scales; Mann-Whithney *U* Test	1. What informal learning activities do primary school teachers undertake? 2. Is there a difference between primary school teachers with and without experience regarding their informal learning activities? 3. What is the role of school culture in the informal learning of primary school teachers?
Hanraets, Hulsebosch, & De Laat	2011	Semi-structured interviews by teleconference	Transcription of the interviews, feedback from respondents, corrections if necessary	1. What are the role and task of the facilitator? 2. What are crucial facilitator interventions that influenced the start and growth of these teacher networks for

				professional development? 3. What are critical conditions that stimulate teachers' networked learning?
Harrison & McKeon	2008	Case studies: three interviews per participants over the course of three years	Developing conceptual categories; Inductive analysis	1. What characterises the developing pedagogical practices of beginning teacher educators? 2. What characterises the developing research/scholarship practices of beginning teacher educators?
Henze, Van Driel, & Verloop	2009	Storyline method	Transcribed interviews; coding; inductive analysis	Contribute to the development of knowledge about teachers' learning in the workplace int he context of educational innovation, and with that, about teachers' learning in the workplace in general
Hoekstra, Beijaard, Brekelmans, & Korthagen	2007	Interview data and observational data; recorded lessons; discussion of lessons with participants	Trascription of interviews, analysis of recorded classes; within-case analysis; cross-case analysis	How can the activities be described through which teachers learn informally from classroom teaching?
Hoekstra, Korthagen, Brekelmans, Beijaard & Imants	2009	Case studies (2); interviews; questionnaires	Transcription of case interviews; thematic coding; case summary matrix	What is the relationship between teachers' informal workplace learning and the perception of workplace conditions?
Hoekstra, Brekelmans, Beijaard & Korthagen	2009	Questionnaire	Coding; Reliable Change Index (RCI); ANOVA	What is the relationship between teachers' learning outcomes and their learning activities in an informal learning environment?
Hoekstra & Korthagen	2011	Questionnaire both teachers and their students; 6 reports per teacher; multiple case study of four teachers for all four 6 lessons of classes were recorded. Follow up study one participant; semi-structured interviews of seven supervisory meetings	Coding; Reliable Change Index (RCI); ANOVA (initial study); MLL principles; descriptive analysis	How does formal learning through supervision differ from informal learning in the professional life of a teacher?
Jones & Dexter	2014	Case studies, six focus groups, semi-structured interviews	Coding; transcripts, NVIVO	Extend the view of teacher learning by contextually examining the role of formal structures within a holistic view of the ways in which teachers learn, including a) formal PD and Professional learning communities, b) informal learning with colleagues, and c) independent learning, to consider how teachers utilize these specific approaches and how to leverage their specific affordances
Jurasaite-Harbinson	2009	Interview data; semi-structured interview; reflective journals and field notes from participants	Grounded Theory; discourse analysis; interactional ethnography; comparative analysis	Examination of workplace (school) cultures as informal contexts for professional learning and ways these contexts enable teacher to learn throughout their careers
Kang & Cheng	2014	Case Study; 9 semi-structured interviews; 13 classroom observations; ethnographic narratives	Transcription; Coding; inductive analysis	1) Do the participating teacher's classroom practices change over time? If so, how do they change? 2) What factors lead to the changes in the teacher's practices? 3) Does the teacher's cognition change over time? If yes, what is the relationship between the teacher's cognition change and her changes in practices?
Klink, Van der Heijden, Boon, & Williams van Rooij	2014	Online survey	Descriptive analysis; item reliability (Crohnbach's α); hierarchical multiple regression analysis (Enter method); ANOVA	Explore the effect of formal and informal learning upon employability. In addition, attention will be paid to the predictive validity of employee and job characteristics and organisational context factors, on the one hand, andformal and informal learning, on the other hand.
Krauss & Guat	2008	Survey	Exporatory factor analysis; descriptive analysis; t-tests	Address the question of what novice teacher's perceptions toward factors influencing learning in the workplace are.
Knight, Tait, & Yorke	2006	Two studies: Survey; electronic interview; telephone interiew; online survey	X	How is non-formal learning promoted and enhanced within the activity systems within which teachers in higher education work?
Kwakman	2003	Survey and open interviews	Factor analyses (Principal Component Analysis); Multiple regression analysis;	1. To what extentdo teacher participate in professional learning activities? 2. What factors affect the participation in professional learning activities?

			hierarchical regression analysis	
Lecat, Beausaert & Raemdonck	2018	Survey	Path model	Examining the relation between teachers' formal and informal learning and employability and IWB. Both the relation between (in)formal learning and IWB is studied, as well as the mediating role of employability.
Lohman	2000	Semi-structured in-depth interviews, site visits	iterative coding; transcribing; interrater analysis;	Develop a deeper understanding of the types of environmental influences that inhibit public school teachers from engaging in informal learning
Lohman	2003	Interviews (semi-structured and in-depth) and site visits	Coding; transcribing; interrater analysis; inductive analysis; matrix conduction	Explore and describe the types of work situations that trigger participation in informal learning activities among public school teachers
Lohman	2005	Written questionnaire with open-ended questions	Descriptive analysis; t-test; content analysis	Examine the degree to which findings from a previous qualitative study of informal learning among public school teachers apply to both a larger, more diverse group of public school teachers and to HRD professionals
Lohman	2006	Written questionnaire with open-ended questions	Descriptive analysis (frequency count, means, standard deviations); t-tests	Survey a larger, more diverse group of public school teachers to examine the factors influencing their engagement in informal learning activities.
Pifer, Baker, & Lunsford	2015	Online Survey	frequency counts and averages (QN); coding and generating themes (QL)	Present new knowledge about the importance of one source of faculty professional development - te informal networks that emerge through departmental relationships and interactions.
Rashid	2018	Semi-structured interviews; three group interviews	X	Seeks to explore how far teacher's engagement in social support on Facebook timelines contributes to the betterment of their professional lives
Rehm & Notten	2016	Data gathering on Twitter users; Amount Followed; Followers; Twitter Birth: Tweets Mentioned; Replies to	Social Network Analys; Cluster Analysis; Matrices	Investigate whether conversations on Twitter have the potential to contribute to informal learning among teachers. Secondly, to take a deeper ook at this process in order to investigate whether and to what extent participation in SNS contributes to social capital formation.
Reichenberg & Andreassen	2018	Survey with Likert scale	Descriptive analysis; variance inflation fator (VIF); reading index; factor analysis; Z-scores	Describe how teachers' human and social capital support their professional development as measured by the aspect of reading habits in leasure time
Richter, Kunter, Klusmann, Lüdtke, & Baumert	2011	Questionnaire	Polynomial regression analysis (multiple regression analysis)	Investigate teachers' uptake of learning opportunities across the career
Schei & Nerbø	2015	Case-Study with semi-structured in-depth interviews	Transcribed, coded, categorized	Enhance understanding of informal learning in the context of Norwegian preschool teachers
Schreurs, Huvenees, & Dolmans	2016	Semi-structured focus groups (4)	Transcribing and coding	Evaluate the impact of a faculty development programme on teachers' educational workplace environment
Springer	2016	Survey	(non-)parametric analyses; Shapiro-Wilk test; descriptive analyses	Investigate in-service music teacher's perceptions of popular music in the classroom and to examine their own preparation to teach popular music
Tarc	2007	13 focus groups (each 5 - 6 participants) and online questionnaires (n=3500 with response rate of approx. 50 percent); individual interviews	Comparative analysis	Explore and illuminate complex meanings, uses, and challenges of teachers' workplace informal learning in the contemporary moment
Thacker	2015	Embedded single-case study with semi-structured interviews	Ongoing thematic analysis; theoretical propositions; rival explanations; constant comparison method; transcribing and coding; inductive analysis	Explore and describe the ways in which teachers engage in professional learning, highlighting their nformal learning in order to contribute to the field by raising consciousness and appreciation of the ways in which social studies teachers learn outside of formal professional development
Thomson	2015	Recorded semi-structured interviews	Transcribed; constant comparative method; grounded theory	Investigate academics' experience of informal conversations, and their experience of the relations between

				conversations and one formal development program
Thomson & Trigwell	2016	Two-stage sampling approach; semi-structured interviews	Transcribed; constant comparative method; grounded theory	Present evidence on how the rol of informal departmental 'corridor' conversations contribute to continuing professional development
Van Eekelen, Boshuizen & Vermunt	2005	Semi-structured interviews; digital diary	Phenomenographic method	Discover whether teachers actively self-regulate their learning experience and to examine how this regulation takes place in the workplace
Van Lankveld, Schoonenboom, Kusurkar, Beishuizen, Croiset & Volman	2016	Semi-structured interviews; observational data	Thematic analysis	Explore the role of teacher communities in enhancing informal peer learning among undergradate medical teachers
Viskovic	2005	Multiple case studies; institutional documents; educational developers; interviews with teachers	Content Analysis; Transcrption of interviews	How do people become tertiary teachers in New-Zealand?
Wilson & Demetriou	2007	Semi-structured interviews; open question responses	Workplace learning and context factors framework	What and how do newly qualified secondary school teachers learn n the early years of their career?

X indicated that the study did not mention the criterion

Appendix F
Summary of informal learning measures from literature review articles

Appendix F: Summary of informal learning measures from literature review articles

Author	What	Summary
Aown (2011)	Informal learning activities	1) Reading about Islam in Bookstore/University/Mosque 2) Talk to others/socialization 3) visit events (conferences/workshops) 4) employment of learning tools/artefacts available on site) 5)Inquiry (asking and questioning local community about Islam) 6) Self-directed
Bakkenes, Vermunt, & Wubbels (2009)	Informal learning activities	1) (Planned) experimenting 2) Considering own practice 3) Experiencing friction (discrepancy between expected/wanted and reality) 4) Getting ideas from others
Collison & Cook	Inhibitors to Informal Learning/Sharing with colleagues + Motivators to engage in IL	1. Professional isolation. 2. Norms of professional autonomy (including norms of egalitarianism and reciprocity. 3. Teachers' views of knowledge 4. Issues involving time + a) Personal attitudes/dispositions b) Interest and practicality at classroom level c) Level of competence (self-efficacy) d) Technical need and assistance e) Principal's encouragement f) Time to share g) Meetings outside of school g)vPhysical location in school h) Relationships with colleagues i) Reaction of other teachers+ I. Lack of time II. Other teachers' attitudes III. Inter-group boundaries IV. Not knowing others well V. Lack of knowledge (also about technology) VI. Problems with equipment VII. Lack of professional learning community
Davis (2015)	Informal learning activities	1) Sharing knowledge and resources 2) Collaborative inquiry 3) Reflective thinking 4) Making the choice when, where, what to learn 5) Diverse perspectives and experiences
Flores (2005)	Informal learning activities	1) Learning while doing/from day-by-day experiences 2) Trial-and-error 3) Socialisation in the workplace 4) try out new things (experimenting) 5) reflection and investigation of self and their practices
Gerken, Beausaert, & Sergers (2016)	Informal learning activities	1) Acting upon feedback supervisor/colleague 2) External information seeking 3) Help seeking
Grosemans, Boon, Verclairen, Dochy, & Kyndt (2015)	Informal learning activities	1) Experimenting 2) Individual/Group reflection (on teaching practices) 3) Reading (emails from publishers on new teaching methods) 4) Visit events of publishers 5) Attend guest lectures on new teaching methods organised by their school 6) Seek information about recent developments in education 7) Collaboration with colleagues 8) Exchanging experiences with colleagues 9) Sharing (exchanging) materials they made themselves 10) Ask colleagues for tips, help, or advice (feedback) 11) Give and receive feedback 12) Learning from pupils/children (media or look up some information)

Hanraets, Hulsebosch, & De Laat (2011)	Informal learning activities	1) Reflect on practice and learning 2) Collaboration with colleagues 3) Give and accept feedback 4) Socialisation (building relationships)
Harrison & McKeon (2011)	Informal learning activities	1) Conversations with a (designated) mentor or colleague(s) 2) Situated learning 3) Watching more experienced colleagues
Henze, Van Driel, & Verloop (2009)	Informal learning activities	1) Experience concrete 'real-life' situations 2) Experience students' activities 3) Testing new materials 4) Try new teaching approaches 5) Reading (professional) journals 6) Reading newspapers 7) Attending professional conferences 8) Browsing the Internet 9) Watching television/film/video/documentaries 10) Reflecting individually upon a lesson 11) Asking or giving help 12) Storytelling: talking about experiences and emotions and scanning for ideas 13) Sharing/Interchange of good practices, materials, and new ideas 14) Reflecting with team members on a lesson
Hoekstra, Beijaard, Brekelmans, & Korthagen (2007)	Informal learning activities	1) Orienting 2) Practising new behaviour/experimenting with something new 3) Seeking (student) feedback 4) Becoming aware and adjust course of action/reframe
Hoekstra, Korthagen, Brekelmans, Beijaard & Imants (2009)	Informal learning activities	1) Reflective dialogue 2) Trying something new/experimenting 3) Individual action-oriented reflection 4) Learning by doing (struggling with behaviour/experiencing friction) 5) Getting ideas from others 6) Receiving and giving feedback
Hoekstra, Brekelmans, Beijaard & Korthagen (2009)	Informal learning activities	1) Experimenting 2) Considering own teaching practice 3) Experiencing discrepancies 4) Struggling with behaviour 5) Getting an idea from others 6) Learning by doing
Hoekstra & Korthagen (2011)	Informal learning activities	1) Experimenting/trying out new learning strategies 2) Individual reflection with the help of supervisor/mentor
Jones & Dexter (2014)	Informal learning activities	1) Sharing and collaboration with colleagues 2) Observation of colleagues 3) Face-to-face conversations with colleagues 4) Searching the Internet (videos, youtube, resources) 5)
Jurasaite-Harbinson	Informal learning activities	1) Observing colleagues' teaching 2) Trial and error 3) Interaction with colleagues (socializing) 4) Learning/interaction with students
Kang & Cheng	Factors promoting change in Informal Learning	1. Teacher experience 2. Reflection on practice 3.Teaching context --> account for positive changes in behaviour and teaching practices/factors triggering change
Klink, Van der Heijden, Boon, & Williams van Rooij (2014)	Informal learning activities	1) Interaction with supervisor 2) Learning value of the job 3) Networking within own organisation 4) networking outside own organisation
Krauss & Guat (2016)	Perceptions to Informal Learning	I. Personal attitude 2. Working conditions 3. Learning system 4. Work expectations
Knight, Tait, & Yorke (2006)	Informal learning activities	1) Learning by doing 2) Workshops/conferences 3) Reading about teaching and learning 4) Guidance from a mentor 5) Online learning 6) Conversations with colleagues in the subject department 7) Attending staff development events 8) Taking advice from staff tutors/course team staff/associate lecturers 9) Taking advice from colleagues outside the Open University 10) Participating in online conferences and discussions 11) Using online resources found by searching the Internet 12) Being part of a course team 13) Participating in course, faculty or OU committees

Kwakman (2003)	Informal learning activities	1) Collegial classroom observation 2) prepare lessons with colleagues 3) ask pupils feedback 4) Use colleagues' materials in own lessons 5) Support colleagues in teaching problems 6) Give opinion to school management 7) Read professional journals 8)Share ideas about pupil counseling 9)Make agreement about way of teaching 10) Join a committee at the school 11) Experiment with new teaching methods 12) Talk about teaching problems with colleagues 13) Adapt way of teaching to pupil's needs 14) Share way of teaching with colleagues 15) Reflect individually on a lesson 16) Construct lesson materials 17)Share ideas about education with colleagues 18) Study subject matter literature 19) Help students to learn study skills
Lecat, Beausaert, & Raemdonck (2018)	Social informal learning activities	1) Feedback seeking 2) Help seeking 3) Information seeking
Lohman (2000)	Inhibitors to Informal Learning	1. Lack of time 2. Lack of proximity to learning resources (other teachers' classrooms, deparment offices, computer technology, library) 3. Lack of meaningful rewards 4. Limited decision-making power in school management
Lohman (2003)	Informal learning activities + Environment for Informal Learning + Personal characteristics influencing the motivation	1) Accomodating to special needs students in general education 2) Collaborate with special education teachers + a) new teaching tasks b) new leadership roles (mentoring teachers, serving as chairs of departments, leading teacher study groups, serving on school/district-wide committees) C. Adherence to policies and procedures (curriculum reviews, reviewing textsbooks and professional literture, talking with colleagues at other school + I. Initiative taking II. Self-efficacy III. Commitment to life-long learning IV. Interest in content area + self-directed
Lohman (2005)	Environmental Inhibitors to Informal Learning	I. Culture does not value/support it II. Funds unavailable III. Guidance for locating sources lacking IV. Inaccessibility of subject matter expert V. Information source lacks credibility VI. Information source unavailable VII. Meeting/work space lacking VIII. Others in workplace are unwilling VIIII Others' workload and lack of time X. Proprietary Information (?) XI. Recognition/rewards for contributions lacking XII. Technology unavailable.
Lohman (2006)	Engagement in Informal Learning	I. Initiative taking II. Self-efficacy III. Love of learning IV. Interest in profession
Pifer, Baker, & Lunsford	Informal learning activities	1) Seek advice from peers, (senior) colleagues, chairs 2) Mentor(ing culture)
Rashid	Informal learning activities	1) Dialogic reflection 2) Conversations with others 3) Sharing experiences
Rehm & Notten	Environment Motivator	Social network + Tweeting
Reichenberg & Andreassen	Informal learning activities	1) Reading newspapers/fiction/nonfiction/digital 2)Talk to colleagues 3) Talk to principal
Richter, Kunter, Klusmann, Lüdtke, & Baumert	Informal learning activities	1) Teacher collaboration 2) Use of professional literature (reading)
Schei & Nerbø (2015)	Informal learning activities	1) Doing something you can and finding it works (experimenting/practicing) 2) Thinking through things for yourself 3) Trying out new solutions and learning if one fails (trial and error) 4) Talking with others and sharing experiences and perspectives (discussion) 5) Problem solving by asking others about what you can do (asking for advice) 6) See that others are doing smart things and trying them yourself (observation) 7) Being shown something and then trying it oneself under guidance (guidance)
Schreurs, Huveneers, & Dolmans (2016)	Informal learning activities	1) Coaching from others 2) Reflection 3) Feedback asking/receiving 4) Feedback giving 5) Consulting colleagues about teaching activities
Springer (2016)	Informal learning activities	1) Listening to variety of musical styles 2) Dancing 3) Interactions with friends and familty 4) Watching and imitating popular musicians 5) Attending musicals 6) Practice 7) Watching popular television shows 8) Observing social media
Tarc	Informal Learning Activity	1. Collaboration with colleagues/others

Thacker (2015)	Informal learning activities	1) Professional reading 2) Researching and/or troubleshooting technology implementation 3) Reflection on instruction (student reactions, student achievement, teacher feelings) 4) Sharing and/or discussing reading materials 5) Scheduled and spontaneous meetings to troubleshoot technology implementation (discussion) 6) Solicitation of feedback from students and colleagues 7) Collaborations to plan/revise curriculum 8) Common planning meetings 9) Email communications to share resources andor engage in common planning activities
Thomson (2015)	Informal learning activities	1) Conversations with colleagues 2) Information seeking 3) Mentoring by someone 4) Generating ideas 5) Sharing
Thomson & Trigwell (2016)	Informal learning activities	1) Conversations with colleagues
Van Eekelen, Boshuizen & Vermunt (2005)	Informal learning activities	1) Learning by doing 2) Figuring something out by trial-and-error 3) Correcting homework 4) Preparing a class 5) Interaction with students in and outside classroom situations 6) Interaction with colleagues 7) Answering e-mails colleagues 8) asking for opinions or explanations colleagues 9) attending colleague's lesson 10) reading a newspaper, book, article 11) Taking time to reflect and think about school matters
Van Lankveld, Schoonenboom, Kusurkar, Beishuizen, Croiset & Volman	Informal learning activities + Sense of Belonging	1) Dialogue with colleagues 2) Sharing of questions, solutions, and interpretations 3) Form an idea based on conversation with colleagues
Viskovic	Informal learning activities + Promotors	1) Working groups 2) C**ommunities of practice** 3) trial and error 4) collaboration with colleagues 5) influence of role models (observing) 6)reflecting on what they were doing 7)attending occasional seminars + strong sense of belonging/shared cultural values/institutional support for development (policy)
Wilson & Demetriou (2007)	Informal learning activities + Mode (planned or incidental) + Social network importance	1) Incidental dialogue with colleagues 2) Informal contact beyond the school with experienced teachers; colleagues from previous employment; university lecturers from initial teacher education courses 3) Individual reflection 4) Collaboration with other teachers 5) Social networks in school 6) email contact + a) Availability web based resources b) School policy c) School-based available resources

Appendix G
Summary of informal learning data collection from literature review articles

Appendix G: Summary of informal learning data collection from literature review articles

Author	Publication Year	Data Collection
Aown	2011	Single qualitative case study + Interview with several open-ended questions and a number of suggestions for follow-up questions
Bakkenes, Vermunt, & Wubbels	2009	Digital Logs every 6 weeks over the course of one year
Collison & Cook	2004	Pre-interview survey; semi-structured interviews; post-interview survey; field notes,
Davis	2015	Embedded case study with three data sources. 1) archived data (Tweets from 2011) 2) Interviews 3) Tweet data from participants
Flores	2005	Semi-structured interviews and questionnaires over the course of two years
Gerken, Beausaert, & Sergers	2016	Online survey (Validated)
Grosemans, Boon, Verclairen, Dochy, & Kyndt	2015	Semi-structured interviews and questionnaire
Hanraets, Hulsebosch, & De Laat	2011	Semi-structured interviews by teleconference
Harrison & McKeon	2008	Case studies: three interviews per participants over the course of three years
Henze, Van Driel, & Verloop	2009	Storyline method
Hoekstra, Beijaard, Brekelmans, & Korthagen	2007	Interview data and observaional data; recorded lessons; discussion of lessons with participants
Hoekstra, Korthagen, Brekelmans, Beijaard & Imants	2009A	Case studies (2); interviews; questionnaires, written reports via email
Hoekstra, Brekelmans, Beijaard & Korthagen	2009B	Questionnaire
Hoekstra & Korthagen	2011	Questionnaire both teachers and their students; 6 reports per teacher; multiple case study of four teachers for all four 6 lessons of classes were recorded.
Jones & Dexter	2014	Follow up study one participant; semi-structured interviews of seven supervisory meetings Case studies, six focus groups, semi-structured interviews
Jurasaite-Harbinson	2009	Interview data; semi-structured interview; reflective journals and field notes from participants
Kang & Cheng	2014	1 case Study; 9 semi-structured interviews; 13 classroom observations; ethnographic narratives
Klink, Van der Heijden, Boon, & Williams van Rooij	2014	Online survey
Krauss & Guat	2008	Survey
Knight, Tait, & Yorke	2006	Two studies: Survey; electronic interview; telephone interview; online survey
Kwakman	2003	Survey and open interviews
Lecat, Beausaert & Raemdonck	2018	Online questionnaire
Lohman	2000	Semi-structured in-depth interviews, site visits
Lohman	2003	Interviews (semi-structured and in-depth) and site visits
Lohman	2005	Written questionnaire with open-ended questions
Lohman	2006	Written questionnaire with open-ended questions
Pifer, Baker, & Lunsford	2015	Online Survey
Rashid	2018	Semi-structured interviews; three group interviews
Rehm & Notten	2016	Data gathering on Twitter users; Amount Followed; Followers; Twitter Birth: Tweets Mentioned; Replies to
Reichenberg & Andreassen	2018	Survey with Likert scale
Richter, Kunter, Klusmann, Lüdtke, & Baumert	2011	Questionnaire
Schei & Nerbø	2015	Case-Study with semi-structured in-depth interviews
Schreurs, Huvenees, & Dolmans	2016	Semi-structured focus groups (4)

Springer	2016	Survey
Tarc	2007	13 focus groups (each 5 - 6 participants) and online questionnaires (n=3500 with response rate of approx. 50 percent); individual interviews
Thacker	2015	Embedded single-case study with semi-structured interviews
Thomson	2015	Recorded semi-structured interviews
Thomson & Trigwell	2016	Two-stage sampling approach; semi-structured interviews
Van Eekelen, Boshuizen & Vermunt	2005	Semi-structured interviews; digital diary
Van Lankveld, Schoonenboom, Kusurkar, Beishuizen, Croiset & Volman	2016	Semi-structured interviews; observational data
Viskovic	2005	Multiple case studies; institutional documents; educational developers; interviews with teachers
Wilson & Demetriou	2007	Semi-structured interviews; open question responses

Appendix H
Interview guide

Appendix H: Interview guide

1. INTRODUCTION :
- Objectif.
- Expliquer comment se déroulera l'entretien.
- Donner la durée approximative de l'entretien (environ 1h).
- Demander l'accord d'enregistrement et expliquer la possibilité d'arrêter à tout moment en cas de demande, sans justification.
- Signaler que les données sont traitées anonymement.
- Remercier la personne.
- Remplir les questions préalables

2. ENTRETIEN :

- Poser la question de départ
- Enchainer en fonction des réponses par les questions suivantes et les questions complémentaires.

3. FIN :
- Résumer ce qui a été dit
- Remplir les questions
- Remercier la personne

Introduction
- Explication du contexte de l'entretien, de son objectif :

« Cette recherche a deux finalités. Premièrement, ***en savoir plus sur la manière dont les enseignants apprennent****, autant de manière formelle qu'informelle, et deuxièmement se pencher sur* ***le lien entre ces apprentissage, les comportements innovants et l'expertise***.

Ce qui intéresse, par l'intermédiaire de la technique des interviews, c'est de pouvoir avoir une approche qualitative et précise, et donc d'avoir ton avis et ton vécu propres, avec des exemples qui importants dans ton expérience.

Il n'y a donc pas de bonne ou de mauvaise réponse. C'est ce que tu as à apporter à la conversation qui nous intéresse. »

- Durée approximative de l'entretien (environ 1h).
- Préciser : - entretien enregistré
  - possibilité d'arrêter à n'importe quel moment sans justification.
  - données traitées anonymement.

« Enfin, n'hésite pas à m'interrompre si tu veux rajouter quelque chose ou si tu as le sentiment que j'ai mal compris ce que tu as dit. »

- Remplir les questions pré-interview dans le guide d'entretien

Entretien - Question de départ

Comment continues-tu à apprendre certaines parties de ton métier ? Comment continues-tu à développer tes compétences ? Lesquelles ?

Questions-guides de l'interview, *avec quelques idées de questions-charnières, pour relancer l'interview*

-Peux-tu nous donner des exemples de situations, de moments où tu as appris quelque chose sur ton métier d'enseignant(e) ?
Qu'est-ce que tu as appris ce jour-là ?

As-tu d'autres exemples de choses que tu as appris sur toi, tes pratiques d'enseignants ou d'autres choses touchant à l'exercice de ton métier ?

-As-tu profité davantage de moments d'apprentissage organisés, avec un formateur ou de moments d'apprentissage informel, non-cadrés ? Peux-tu nous donner quelques exemples de chaque ?
Qu'apprends-tu des journées pédagogiques ? D'autres formations ?
Et donc les moments d'apprentissage formels/informels t'apportent plus ?

-Penses-tu augmenter ton expertise et ta capacité d'adaptation via les choses que tu apprends ?
En quoi augmentes-tu ton expertise ? Comment le vois-tu ?
Quels apprentissages t'ont-ils déjà aidé à mieux t'adapter ?

-Penses-tu que cela te pousse à apporter de nouvelles méthodes et pratiques ou d'autres nouveautés dans tes classes ou en dehors ?
Quelles innovations as-tu apporté à ton travail suite à un apprentissage que tu as fait au cours de ta carrière

Comment a évolué cette formation continue, comment ont évolué ces apprentissages, au cours du temps ?
Selon toi, quelle est la différence entre l'apprentissage fait par les professeurs expérimentés et les jeunes professeurs ?
Comment et pourquoi penses-tu que ça évolue ?

3. FIN : [Quand l'enregistreur est éteint → penser à prendre note au bas de cette page si la personne ajoute des points essentiels].

- Résumer ce que j'ai compris en gros de ce que la personne a apporté.
→ Permet un recadrage ou une hiérarchie dans l'importance des éléments énoncés.

« Est-ce que tu t'attendais à ce qu'on aborde un thème qui n'a pas été abordé ? Au-delà de ça, est-ce que tu voudrais en parler ? »

- Remplir les questions post-interview du guide d'entretien :
- La remercier.

Enfin :
- Noter les éventuels points étonnants, les contradictions verbales parmi le flux logique de pensées ou le manque de congruence entre le verbal et le non-verbal.
- Noter ce qui doit être amélioré lors de prochains entretiens.

Appendix I
Descriptive list of 41 interviewees

Appendix I: Descriptive list of 41 interviewees

Identification number	Age	Experience	Gender	Network	Class
1	32	11	Female	Private	Primary, 2
2	26	5	Female	Private	Primary, 2
3	33	12	Female	Private	Primary, 2,4 & 6
4	47	25	Female	Private	Primary, 1
5	54	34	Female	Public	Primary, 5
6	58	34	Male	Public	Primary, 5
7	54	35	Female	Public	Secondary, 6
8	29	7	Female	Public	Primary, 4-5
9	30	7	Female	Public	Primary, 2
10	41	14	Female	Public	Primary, 2
11	35	12	Female	Private	Secondary, 1, 2 & 3
12	30	9	Female	Private	Secondary, 4, 5 & 6
13	43	22	Female	Private	Secondary, 4
14	60	38	Male	Public	Secondary, 4, 5 & 6
15	30	3	Male	Public	Secondary, 1, 2 & 3
16	23	3	Female	Private	Primary, 4
17	56	36	Female	Private	Primary, 4
18	51	10	Female	Public	Secondary, 1, 2 & 3
19	54	4	Female	Public	Secondary, 3, 4 & 5
20	22	2	Female	Public	Primary, 1
21	44	22	Female	Public	Primary, 3
22	34	10	Female	Public	Primary, 5
23	26	4	Male	Private	Secondary, 1, 2 & 3
24	34	12	Female	Private	Secondary, 1, 2 & 3
25	56	33	Male	Private	Secondary, 5 & 6
26	49	27	Female	Public	Primary, 4
27	24	3	Female	Public	Primary, 5
28	35	10	Female	Public	Primary, 4
29	30	8	Female	Public	Secondary, 1
30	25	1	Female	Private	Secondary, 1 & 2
31	30	6	Female	Private	Secondary, 1 & 2
32	26	3	Female	Private	Secondary, 1 & 2
33	25	2	Female	Private	Secondary, 1 & 2
34	26	4	Female	Public	Primary, 3
35	24	2	Female	Public	Secondary, 2
36	25	3	Male	Private	Secondary,
37	23	1	Female	Private	Secondary, 3
38	24	2	Female	Private	Secondary
39	21	1	Male	Public	Secondary
40	32	2	Male	Public	Secondary, 5 & 6
41	27	2	Female	Private	Primary

Appendix J
Questionnaire used in Chapter 4

Appendix J: Questionnaire used in Chapter 4

Introduction

En remplissant ce questionnaire, vous prenez part à une étude visant à étudier l'apprentissage continu des enseignants et le lien avec l'expertise, la flexibilité et les comportements d'innovation.

Il est important que les informations que vous allez fournir soient correctes et les plus spontanées possible. La complétion de l'ensemble des questions par un nombre important d'enseignants garantira la qualité de cette recherche. Les informations que vous nous donnerez participeront à une meilleure compréhension de l'apprentissage et du développement professionnel des enseignants.

La durée de ce questionnaire est estimée à une vingtaine de minutes. Les réponses fournies resteront complètement anonymes et confidentielles. De plus, nous nous engageons à vous transmettre les résultats et conclusions de cette étude s'ils vous intéressent. Vous aurez la liberté de nous laisser une adresse mail sur laquelle vous les envoyer en fin de questionnaire.

Nous vous remercions pour votre aide et votre temps.

Bon questionnaire.

Questions démographiques

1. Vous êtes ?
   a. *Un homme*
   b. *Une femme*

2. Quel âge avez-vous ?
   Menu déroulant de 18 à 65 ans

3. Combien d'années d'expérience avez-vous dans l'enseignement ?
   Menu déroulant de 0 à 45 ans

4. À quel niveau du système éducatif travaillez-vous ?
   a. *Au fondamental / en primaire*
   b. *En humanité / en secondaire*

Activités formelles d'apprentissage

5. Combien de temps (en heures) avez-vous passé l'année scolaire passée (2014-2015) dans des activités d'apprentissage formel de type :
   a. *Conférences*
   b. *Séminaires*
   c. *Cours (master complémentaire, agrégation,…)*
   d. *Formations pédagogiques*
   e. *Autres formations*

Apprentissage informel social (Froehlich, Beausaert & Segers, 2015 ; Likert 1-5)

6. À quelle fréquence avez-vous eu ces comportements d'apprentissage informel social, au cours de l'année scolaire passée (2015-2016) ? *(Échelle de Likert à 5 points. 1 = Presque jamais, 5 = Très souvent)*

a) J'ai demandé à mes collègues d'évaluer mon travail
b) J'ai abordé mes collègues pour demander des feedbacks sur mon travail
c) J'ai demandé à mes collègues leurs opinions sur mes performances au travail
d) J'ai cherché du feedback sur la manière de m'améliorer
e) J'ai cherché des idées sur la manière d'améliorer mes compétences professionnelles
f) J'ai demandé à mes collègues de l'aide dans les difficultés que j'ai rencontré
g) J'ai évité de demander de l'aide à mes collègues, pour ne pas qu'ils pensent que je suis incompétent (R)
h) J'ai demandé à mes collègues la manière de résoudre un problème au travail
i) J'ai hésité à demander de l'aide extérieure quand j'ai eu un problème relatif à mon travail (R)
j) Lorsque j'ai été bloqué(e) par un problème, j'ai demandé à mes collègues de m'aider
k) Lorsque j'ai manqué d'information, je me suis renseigné(e) auprès de mes collègues
l) J'ai préféré trouver les choses par moi-même, plutôt que demander de l'aide aux autres (R)
m) Je me suis renseigné(e) auprès de mes collègues
n) J'ai demandé des informations sur le travail que je fais
o) J'ai rassemblé les informations venant de mes collègues

7. Dans quelle mesure êtes-vous d'accord sur ces phrases, portant sur l'apprentissage informel social que vous avez eu l'année scolaire dernière (2015-2016) ? *(Échelle de Likert à 5 points. 1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) J'ai utilisé les feedbacks reçus pour mon développement professionnel
b) J'ai utilisé les feedbacks reçus pour améliorer mes performances et pratiques au travail
c) Je n'ai rien appris des feedbacks reçus
d) J'ai été capable d'utiliser les feedbacks reçus
e) Je n'ai pas été capable d'améliorer mes pratiques en fonction des feedbacks que j'ai reçus
f) J'ai beaucoup appris lorsque j'ai demandé de l'aide à mes collègues
g) J'ai résolu de nombreux problèmes en demandant de l'aide à mes collègues
h) La plupart de l'aide que j'ai demandée n'a pas résolu mes problèmes
i) Je n'ai rien appris des personnes qui m'ont aidé(e) à résoudre mes problèmes
j) Je n'ai pas été capable d'améliorer mes performances à partir de l'aide que j'ai reçue de mes collègues
k) J'ai utilisé les informations que j'ai cherchées pour devenir meilleur dans mon travail
l) J'apprends habituellement des choses sur mon travail à partir des informations que j'ai cherchées
m) J'utilise souvent les informations que je cherche sur mon travail
n) Je n'utilise pas la plupart des informations que je trouve sur mon travail
o) Les informations que je reçois ne m'aident pas à m'améliorer dans mon travail

Employabilité (Van der Heiden, Boon, Van der Klink & Meijs, 2009; Likert 1-5)

8. Dans quelle mesure êtes-vous d'accord avec les affirmations suivantes sur votre sentiment d'expertise ? *(Échelle de Likert à 5 points. 1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) Je passe beaucoup de temps à améliorer mes connaissances et mes compétences utiles pour mon travail.
b) Durant l'année écoulée, j'ai été compétent dans l'exercice de mon métier d'enseignant de manière efficace, avec peu d'erreurs
c) Je me considère comme compétent pour dire si mes connaissances sont insuffisantes pour faire une tâche ou résoudre un problème
d) En général, je suis compétent pour distinguer les les questions primordiales des questions secondaires, et fixer des priorités

9. Dans quelle mesure êtes-vous d'accord avec les affirmations suivantes sur la manière dont vous abordez les tâches professionnelles ? *(Échelle de Likert à 5 points. 1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) Je passe beaucoup de temps à améliorer mes connaissances et mes compétences utiles pour mon travail.Durant l'année écoulée, j'ai été compétent dans l'exercice de mon métier d'enseignant de manière efficace, avec peu d'erreurs
b) J'accorde de l'importance à la mise en oeuvre des connaissances et des compétences nouvellement acquises
c) Au cours de cette année, je me suis engagé dans la recherche et dans la découverte d'éléments me permettant de m'épanouir dans mon emploi
d) Au cours de cette année, je me suis mis à jour au niveau des nouveautés de mon domaine de travail

10. Dans quelle mesure êtes-vous d'accord avec les affirmations suivantes sur votre adaptation aux différentes tâches professionnelles ? *(Échelle de Likert à 5 points. 1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) J'ai une bonne capacité d'adaptation aux changements dans mon milieu de travail.
b) Je suis capable de m'adapter aux développements au sein de mon secteur
c) Je suis capable de m'adapter rapidement et de profiter des changements soudains dans mon lieu de travail
d) Je vais devoir réaliser plusieurs étapes afin d'arriver à la fonction que je souhaite atteindre.
e) Face aux changements dans ma fonction, j'ai une attitude très positive

11. Dans quelle mesure êtes-vous d'accord avec les affirmations suivantes sur le travail collectif ? *(Échelle de Likert à 5 points. 1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) Je prends part aux tâches quotidiennes au sein de mon école
b) Dans mon travail, je prends l'initiative de partager des responsabilités avec des collègues
c) Je partage les valeurs, la vision commune et les objectifs de mon école
d) Je partage mon expérience et mes connaissances avec les autres

12. Dans quelle mesure êtes-vous d'accord avec les affirmations suivantes sur votre équilibre privé/professionnel ? *(Échelle de Likert à 5 points. 1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) Mon travail et ma vie privée sont équilibrés
b) Mes efforts de travail sont en proportion de ce que je reçois en retour
c) Le temps que je passe sur mon travail et sur mon perfectionnement professionnel est en équilibre par rapport au temps passé à mon développement personnel et à mes activités de détentes
d) J'alterne de manière équilibrée le temps passé à réaliser mes propres objectifs de carrière et le travail de soutien accordé à mes collègues

Innovative Work Behaviour (Janssen, 2000)

13. Dans quelle mesure, diriezvous que dans votre travail, vous essayez de ... *(Échelle de Likert à 6 points. 1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) Obtenir par vous-même des informations sur la structure et les procédures dans l'établissement
b) Obtenir par vous-même des informations sur les derniers développements au sein de l'établissement
c) Obtenir par vous-même des informations sur les concepts ou idées liés à votre champ professionnel
d) Obtenir par vous-même des informations sur les nouveaux développements des autres établissements
e) Convaincre les autres d'une nouvelle idée ou solution
f) Faire appel aux personnes ayant les autorisations et les ressources nécessaires
g) Promouvoir des nouvelles idées à votre direction pour obtenir son soutien actif
h) Promouvoir des nouvelles idées à vos collègues pour obtenir leur soutien actif
i) Promouvoir l'application d'une nouvelle solution dans votre contexte de travai
j) Garder vos collègues informés de l'avancement de la réalisation d'une idée
k) Favoriser auprès de vos collègues l'application d'une solution développée
l) Tester l'évolution des solutions et des lacunes dans la mise en pratique d'une nouvelle idée
m) Analyser l'évolution des solutions et des effets indésirables lors de la mise en pratique d'une nouvelle idée
n) Évaluer les progrès durant la mise en pratique d'une nouvelle idée
o) Définir les critères de réussite lors de la réalisation d'une nouvelle idée
p) Examiner les croyances importantes
q) Aborder les choses qui doivent changer directement
r) Poser des questions critiques
s) Suggérer des améliorations sur les idées exprimées

Fin du questionnaire

14. Désirez-vous recevoir les résultats de cette recherche par mail ?
    a. Oui
    b. Non
        i. Si oui, questions supplémentaires

À quelle adresse mail désirez-vous recevoir les résultats ?
Question ouverte

Appendix K
Questionnaire used in Chapter 5

Appendix K: Questionnaire used in Chapter 5

Introduction

En remplissant ce questionnaire, vous prenez part à une étude visant à étudier les déterminants les plus importants de l'apprentissage continu des enseignants. Il est important que les informations que vous allez fournir soient correctes et les plus spontanées possible.

La complétion de l'ensemble des questions par un nombre important d'enseignants garantira la qualité de cette recherche. Les informations que vous nous donnerez participeront à une meilleure compréhension de l'apprentissage et du développement professionnel des enseignants.

La durée de ce questionnaire est estimée à une quinzaine de minutes. Les réponses fournies resteront complètement anonymes et confidentielles.

De plus, nous nous engageons à vous transmettre les résultats et conclusions de cette étude s'ils vous intéressent. Vous aurez la liberté de nous laisser une adresse mail sur laquelle vous les envoyer en fin de questionnaire.

Nous vous remercions pour votre aide et votre temps.

Bon questionnaire.

Questions démographiques

1. Quel âge avez-vous ?
   Menu déroulant de 18 à 65 ans

2. Combien d'années d'expérience avez-vous dans l'enseignement ?
   Menu déroulant de 0 à 45 ans

3. Etes-vous ?
   a. *Un homme*
   b. *Une femme*

4. À quel niveau du système éducatif travaillez-vous ?
   a. *Au fondamental / en primaire*
   b. *En humanité / en secondair*

5. Quel type de contrat avez-vous ?
   Question ouverte

Climat d'apprentissage (repris et traduit de Nikolova, Van Ruysseveldt, De Witte & Syroit, 2014 ; Likert 1-7)

6. Dans quelle mesure trouvez-vous ces affirmations correctes, au sujet de votre école (si vous travaillez dans plusieurs écoles, dans où vous êtes le plus souvent ?

a) Mon école fait des offres de formation attrayantes
b) Mon école fournit des ressources suffisantes pour développer mes compétences professionnelles
c) Au sein de mon école, chacun reçoit les formations dont il a besoin
d) Au sein de mon école, les enseignants qui se développent professionnellement en continu sont récompensés
e) Les enseignants sont rapidement reconnus s'ils s'engagent continuellement dans leur développement professionnel
f) Au sein de mon école, les enseignants qui font des efforts pour apprendre de nouvelles choses gagnent en appréciation et respect
g) Au sein de mon école, les enseignants ont peur d'admettre leurs erreurs
h) Au sein de mon école, les enseignants n'osent pas discuter de leurs erreurs entre eux
i) Au sein de mon école, les enseignants ont peur de discuter ouvertement des problèmes liés au travail

Apprentissage informel social (Froehlich, Beausaert & Segers, 2015 ; Likert 1-5)

7. À quelle fréquence avez-vous eu ces comportements d'apprentissage informel social, au cours de l'année scolaire passée (2015-2016) ? *(1 = Presque jamais, 5 = Très souvent)*

a) J'ai demandé à mes collègues d'évaluer mon travail
b) J'ai abordé mes collègues pour demander des feedbacks sur mon travail
c) J'ai demandé à mes collègues leurs opinions sur mes performances au travail
d) J'ai cherché du feedback sur la manière de m'améliorer
e) J'ai cherché des idées sur la manière d'améliorer mes compétences professionnelles
f) J'ai demandé à mes collègues de l'aide dans les difficultés que j'ai rencontré
g) J'ai évité de demander de l'aide à mes collègues, pour ne pas qu'ils pensent que je suis incompétent (R)
h) J'ai demandé à mes collègues la manière de résoudre un problème au travail
i) J'ai hésité à demander de l'aide extérieure quand j'ai eu un problème relatif à mon travail (R)
j) Lorsque j'ai été bloqué(e) par un problème, j'ai demandé à mes collègues de m'aider
k) Lorsque j'ai manqué d'information, je me suis renseigné(e) auprès de mes collègues
l) J'ai préféré trouver les choses par moi-même, plutôt que demander de l'aide aux autres (R)
m) Je me suis renseigné(e) auprès de mes collègues
n) J'ai demandé des informations sur le travail que je fais
o) J'ai rassemblé les informations venant de mes collègues

8. Dans quelle mesure êtes-vous d'accord sur ces phrases, portant sur l'apprentissage informel social que vous avez eu l'année scolaire dernière (2015-2016) ? *(1 = Pas du tout d'accord, 5 = Tout à fait d'accord)*

a) J'ai utilisé les feedbacks reçus pour mon développement professionnel
b) J'ai utilisé les feedbacks reçus pour améliorer mes performances et pratiques au travail
c) Je n'ai rien appris des feedbacks reçus
d) J'ai été capable d'utiliser les feedbacks reçus
e) Je n'ai pas été capable d'améliorer mes pratiques en fonction des feedbacks que j'ai reçus
f) J'ai beaucoup appris lorsque j'ai demandé de l'aide à mes collègues
g) J'ai résolu de nombreux problèmes en demandant de l'aide à mes collègues
h) La plupart de l'aide que j'ai demandée n'a pas résolu mes problèmes
i) Je n'ai rien appris des personnes qui m'ont aidé(e) à résoudre mes problèmes
j) Je n'ai pas été capable d'améliorer mes performances à partir de l'aide que j'ai reçue de mes collègues
k) J'ai utilisé les informations que j'ai cherchées pour devenir meilleur dans mon travail
l) J'apprends habituellement des choses sur mon travail à partir des informations que j'ai cherchées
m) J'utilise souvent les informations que je cherche sur mon travail
n) Je n'utilise pas la plupart des informations que je trouve sur mon travail
o) Les informations que je reçois ne m'aident pas à m'améliorer dans mon travail

Fin du questionnaire

9. Désirez-vous recevoir les résultats de cette recherche par mail ?
   a. Oui
   b. Non
      i. Si oui, questions supplémentaires

   À quelle adresse mail désirez-vous recevoir les résultats ?
   Question ouverte