

# **DETERMINANTS OF STARTING A TEACHING CAREER**

## A Multilevel Analysis

H. Tierens & M. Smet





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## **A Multilevel Analysis**

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# Beleidssamenvatting

## Algemeen

Het belang van leerkrachten in onze huidige, kennis-gedreven maatschappij wordt te vaak onderschat. De kwaliteit van het huidige onderwijssysteem berust voornamelijk op de mogelijkheid om ieder individu te voorzien van kwalitatief onderwijs, wat verzorgd dient te worden door voldoende vaardige en gemotiveerde leerkrachten. De arbeidsmarkt voor leerkrachten komt steeds vaker onder druk te staan. Dit is grotendeels te wijten aan de wisselwerking tussen pieken en dalen in zowel de vraag naar als het aanbod van leerkrachten, wat ook het uittekenen van gepast beleid sterk bemoeilijkt. Dit rapport maakt deel uit van een reeks rapporten over het loopbaanproces van leerkrachten. In deze reeks zullen actuele vragen over de instroomkeuze in lerarenopleidingen, de doorstroomkeuze van afgestudeerde leerkrachten naar het leerkrachtenberoep en de uitstroom van jonge leerkrachten uit het beroep onderzocht worden. Het huidige rapport belicht de tweede thematiek.

De voorspelling van de vraag naar onderwijs, en dus ook leerkrachten, kan worden gelinkt aan de bevolkingsgroei. Hoe groter de nieuwe generatie wordt, hoe groter de vraag naar onderwijs zal zijn (i.e. indien de huidige hoogte van de participatie in onderwijs constant blijft of stijgt). Het recht op leren is een basisrecht van de mens en dus moet het aanbod zodanig gestuurd worden dat de vraag volledig wordt voldaan. Het aanbod aan leerkrachten bestaat uit het huidige leerkrachtenbestand, verminderd met de pensioneringsgolven (die door een vergrijzend leerkrachtenbestand in kwantiteit groeien) en het verloop (leerkrachten die hun beroepsactiviteit als leerkracht stopzetten voor hun pensioengerechtigde leeftijd), vermeerderd met de doorstroom van pas afgestudeerde leerkrachten vanuit de lerarenopleidingen in hoger onderwijs alsook de instroom van niet-gecertificeerde leerkrachten en zij-instroom. Het verloop uit het huidige leerkrachtenbestand is groot, vooral bij beginnende leerkrachten (i.e. de eerste vijf jaar in het beroep). Daarenboven laat ook de doorstroom van afstuderende leerkrachten naar het leerkrachtenberoep te wensen over.

Veel theoretische modellen focusten reeds op psychologische processen en perceptieprocessen om doorstroom naar het leerkrachtenberoep te verklaren. Deze modellen werden vaak getest op steekproeven van startende leerkrachten op een moment na het maken van de doorstroombeslissing. Deze modellen hinken echter achterop als instrument op om deze doorstroombeslissing te voorspellen vooraleer de eigenlijke beslissing werd genomen. Het doel van dit rapport bestaat erin om een beeld te krijgen van de doorstroomprofielen van leerkrachten uit de lerarenopleidingen en om de determinanten van deze doorstroombeslissing te identificeren. Hiervoor wordt volgende onderzoeksvraag als rode draad vooropgesteld: “Kan de doorstroom van pas afgestudeerde leerkrachten naar het leerkrachtenberoep in Vlaanderen worden voorspeld/verklaard op basis van de kenmerken van het individu in relatie tot zijn omgeving?”

## Onderzoeksontwerp en data

De beslissing van het individu wordt binnen een theoretisch raamwerk geplaatst waarbij het individu expliciet in relatie wordt gebracht met zijn/haar omgeving. Het empirisch raamwerk om deze data correct te analyseren bestaat uit het uitvoeren van multilevel regressieanalyses. Buiten het individuele niveau, waarin zowel individuele kenmerken en studiehistoriek zijn vervat, zijn er verschillende mogelijke omgevingsniveaus, welke allen onafhankelijk van elkaar kunnen (maar niet noodzakelijk zo) worden gedefinieerd. Vooreerst wordt de hogere onderwijsinstelling waar het individu de lerarenopleiding voltooide in beschouwing genomen. Deze omgeving vormt zowel een collegiale omgeving waarin studenten kennis maken met het leerkrachtenberoep en de nodige vaardigheden en attitudes ontwikkelen met het oog op doorstroom naar de arbeidsmarkt als leerkracht. Tegelijkertijd vormt deze omgeving ook een competitieve omgeving, waarbij alle afstuderende leerkrachten zich van elkaar proberen onderscheiden met als doel een gunstigere perceptie op de arbeidsmarkt te creëren voor zichzelf. Door de heterogeniteit aan (a priori en a posteriori) motivaties is het waarschijnlijk dat deze omgeving een sterke invloed kan hebben op de doorstroombeslissing. Ten tweede wordt ook de geografische omgeving van het individu in beschouwing genomen, die gedefinieerd wordt als de gemeente waarin het individu woonachtig is op het moment van afstuderen. Deze omgeving omvat de dagdagelijkse ruime levenssfeer van het individu en incorporeert hierbij provisie van opportuniteiten op educationeel en occupationeel vlak en maatschappelijke omgeving/status. Ten derde kan ook een gezinsniveau gedefinieerd worden, waarbij de dagdagelijkse levenssfeer veel dichterbij het individu brengt. Dit niveau omvat de gezinstoestand op occupationeel en educationeel vlak alsook de financiële toestand van het gezin. Aangezien louter de laatste van deze indicatoren kan worden afgeleid uit de gebruikte data en er bovendien geen indicator aanwezig is om individuen te koppelen op het gezinsniveau, werd dit niveau samengevoegd met het individuele niveau.

De gebruikte data zijn afkomstig uit gedetailleerde administratieve databanken van het hoger onderwijs, ter beschikking gesteld door het Vlaams Ministerie van Onderwijs en Vorming, gelinkt<sup>1</sup> met de leerkrachtenopdrachten voor de volledige cohorte studenten die een lerarenopleiding aan hogescholen en universiteiten succesvol voltooiden tussen academiejaren 2005-2006 en 2013-2014. De gegevens uit Centra voor Volwassenenonderwijs werden niet gebruikt omwille van beperkingen van de data. Deze werkwijze brengt individuele en omgevingskenmerken samen met de specifieke arbeidsmarktsituatie na afstuderen.

In het ontwerp van de analyse werden twee modellen verwerkt. Een eerste model analyseert de doorstroomkeuze naar de arbeidsmarkt op het moment van afstuderen uit de lerarenopleiding, waarbij het individu een keuze maakt uit om (i) binnen de termijn van één volledig kalenderjaar volgend op het jaar van afstuderen door te stromen naar het leerkrachtenberoep (63%), (ii) verder te studeren in hoger onderwijs (21%) of (iii) op zoek te gaan naar (of van start gaan in) een job buiten het Vlaamse onderwijs (16%). Een tweede model modelleert de doorstroomkeuze na definitieve afronding van het hoger onderwijs, waarbij de keuze wordt beperkt tot al dan niet doorstromen naar het leerkrachtenberoep (72% stroomt door). Dit laatste model beschouwt uitsluitend die afgestudeerden als leerkracht gekwalificeerd die beslisten om hun hogere onderwijs carrière voort te zetten en/of na het (zoeken naar) werk(en) buiten onderwijs hun studiercarrière in hoger onderwijs opnieuw hervatten.

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<sup>1</sup> Machtiging verkregen door de Vlaamse Toezichtcommissie: VTC/M/2015/04/CV .

## Resultaten

Het belang van de omgevingsinvloeden op de doorstroombeslissing van de afgestudeerde leerkrachten was divers. De geografische omgeving had weinig tot geen belang bij het maken van de doorstroombeslissing, terwijl ongeveer een kwart van de totale variatie in doorstroombeslissingskansen vertegenwoordigd werd door de hogere onderwijsinstellingsomgeving. Zo blijkt dat de competitieve en collegiale omgeving van het individu een relatief grote invloed heeft op de doorstroombeslissing naar de arbeidsmarkt.

Het profiel van doorstromende leerkrachten, dat vrij stabiel en persistent werd bevonden over beide modellen heen, kan worden beschreven als vrouwen met de Belgische nationaliteit, voornamelijk woonachtig in Vlaanderen, die vaak bewust kozen voor de lerarenopleiding en/of beschikken over voldoende hoge academische vaardigheden.

Met betrekking tot de onderwijs carrière van de gekwalificeerde (i.e. gediplomeerde) leerkrachten hadden vooral gediplomeerden met een BSO- en/of TSO-vooropleiding in secundair onderwijs een hogere kans op door te stromen naar het leerkrachtenberoep. Deze gediplomeerden stroomden vooral door naar posities in kleuteronderwijs na het volgen van een professionele bachelor of een bachelor-na-bachelor-programma. Dit laatste programma werd vooral gevolgd om leerkrachtenvaardigheden in omgang met leerlingen uit het buitengewoon onderwijs, leerlingen met leerachterstand en nood aan speciale begeleiding aan te scherpen. De gediplomeerden met een secundaire vooropleiding in ASO zijn meer waarschijnlijk om hun studie-carrière in hoger onderwijs verder te zetten na het behalen van hun initiële leerkrachtendiploma (zowel GLO (i.e. geïntegreerde lerarenopleiding als bachelordiploma) als SLO (i.e. specifieke lerarenopleiding als vervolgopleiding na het behalen van een masterdiploma)).

Om dieper inzicht te verwerven in de doorstroombeslissing van gediplomeerden uit een specifieke lerarenopleiding, dus met een verworven vakexpertise buiten de lerarenopleiding, werd gevonden dat vakexperten in onderwijsgerelateerde richtingen (e.g. pedagogie en onderwijskunde) alsook kunst, taal en geschiedenis een hogere kans hebben om door te stromen naar het leerkrachtenberoep, terwijl experts in biomedische, toegepaste en exacte wetenschappen een veel minder waarschijnlijk zijn om door te stromen. Deze observatie valt voornamelijk te duiden op basis van de aanwezigheid van relatief interessantere en aantrekkelijkere (op basis van het afstudeerprofiel) loopbaanperspectieven en arbeidsmarktopportunities buiten onderwijs.

Het tijdelijk onderbreken van de studie-carrière in hoger onderwijs heeft een sterke invloed op de doorstroombeslissing op het einde van de studiecarière in hoger onderwijs. Studenten die na hun studieonderbreking zich verder specialiseren in onderwijsgerelateerde richtingen, worden verwacht deze keuze op weloverwogen basis gemaakt te hebben en zullen hierna eerder doorstromen naar het leerkrachtenberoep. Studenten die zich heroriënteren naar een onderwijsgerelateerde opleiding en studenten die zich heroriënteren buiten onderwijs hebben een marginaal kleinere kans om door te stromen naar het leerkrachtenberoep, hoewel deze verschillen niet statistisch significant werden bevonden. Dit kleine effect relativeert evenwel het verwachte grote effect van de 'fallback career'-optie, waarbij het leerkrachtenberoep wordt aanzien als een terugvalmogelijkheid op de arbeidsmarkt, maar mogelijk niet meteen na afstuderen doorstromen als leerkracht. Hoe langer de duurtijd van de onderbreking in de studiecarière, hoe minder waarschijnlijk het wordt dat het individu doorstroomt naar het leerkrachtenberoep. De verantwoording van dit effect kan mogelijk gevonden worden in de

redenen voor de studieonderbreking, waarover in dit onderzoek geen informatie werd verkregen. Het is dus niet mogelijk om sluitende antwoorden te formuleren, doch trachten we dit effect intuïtief te verklaren op basis van frustraties bij het (bewust of onbewust) niet onmiddellijk vinden van een arbeidsmarktbetrekking bij onderbreking van ten minste één academiejaar. Aangezien deze variabele louter significant werd bevonden in het schattingsmodel waarbij alle individuen reeds beschikken over een leerkrachtendiploma is het mogelijk dat dit ook een van de redenen is voor heroriëntering buiten onderwijs.

Het ontvangen van een studiebeurs of een andere financiële ondersteuning tijdens de studie-carrière in hoger onderwijs kan dienen als indicator voor een lagere socio-economische status van de familie van het individu. De theorie van intergenerationale weerspiegeling en mobiliteit stelt dat recentere generaties steeds beogen om via onderwijs en professionele activiteit een positie te bereiken die minstens die van de vorige generatie evenaart en zo mogelijk overtreft. Deze theorie wordt door onze resultaten bevestigd. Zo worden afgestudeerden die financiële ondersteuning kregen bevonden om harde en realistische werkers te zijn. Zo zullen zij kiezen om of hun behaalde diploma te valoriseren en door te stromen naar het leerkrachtenberoep, of hun studie-carrière verder te zetten om hun occupationele horizons te verbreden. Voor deze laatste groep heeft dit echter negatieve gevolgen voor doorstroom naar het leerkrachtenberoep op het moment van definitief afstuderen uit hoger onderwijs. Door het verbreden van de mogelijkheden op de arbeidsmarkt zullen gediplomeerden waarschijnlijk kiezen voor de arbeidsmarktpositie met het hoogste rendement voor de investering in voortgezet hoger onderwijs, wat betekent dat ze minder waarschijnlijk zijn om door te stromen naar het leerkrachtenberoep, wat finaal reeds bewerkstelligd had kunnen worden met het eerste diploma.

Op het niveau van de hogere onderwijsinstelling is voornamelijk de compositie van het studentenbestand binnen de lerarenopleiding aan de hogere onderwijsinstelling van belang. Een hoog aandeel van mannelijke studenten, die vaak meer interesse hebben voor prestigieuze banen met meer toekomstperspectief en hoge verloning, verkleint de kans op doorstroom naar het leerkrachtenberoep. De multiculturaliteit van het studentenbestand draagt positief bij aan de kans tot doorstroom. In de wetenschappelijke literatuur werd meermaals gevonden dat leerkrachten toleranter, en zelfs constructiever, zijn ten aanzien van een multiculturele samenleving. De combinatie van deze bevindingen met de resultaten van dit rapport zou kunnen aangeven dat leerkrachten inderdaad neutraler of zelfs positiever aankijken tegen een multiculturele samenleving en de motivatie vinden om deze visie door te geven aan de jongere generaties van de samenleving.

Verder werd ook opgemerkt dat de aanwezigheid van meerdere scholen in de nabijheid van de woonplaats van het individu, gebruikt als benadering van de lokale arbeidsmarktopportunities, geen effect heeft op de doorstroombeslissing. Dit betekent evenwel dat doorstromende studenten bereid zijn om te gaan werken buiten de nabijheid van hun woonplaats (wat werd gekwantificeerd als dertig kilometer woon-werk-afstand). Ze zijn dus niet 'honkvast', wat op het eerste zicht een toegeving/flexibiliteit is op de arbeidsmarkt. Hierbij kan een kanttekening gemaakt worden dat deze flexibiliteit op termijn ook een last zou kunnen worden, wat ten slotte ook kan leiden tot een snelle uitstroom uit het leerkrachtenberoep.

# Introduction

In today's dynamic and complex world, the ability to cope with change and rapid development of novelties is indispensable but requires large amounts of knowledge. The current 'Learning Economy' identifies the purpose of economic activity not solely as consumption, as has been argued by Smith (1776), but also as the development of knowledge and human education to ensure sustainability of future generations (Hodgson, 1999). Thus, an economy has to focus on the quality and stability of its educational system, which can be accomplished by caring for the teachers since they are regarded as the most efficient medium for equity, access and quality in education (UNESCO, 2014).

In Flanders, the northern, Dutch-speaking half of Belgium, concerns have risen about the weakening quality of both inflow and outflow of students in teaching education programs (Huyge et al., 2009; Matheus et al., 2004). Furthermore, the Flemish teaching labor market seems to be characterized by supply instabilities, depending on both volatile inflow into the teaching profession and high outflow of both young starting teachers and experienced teachers near retirement age (Huyge et al., 2009; Matheus et al., 2004). This research report will focus on the inflow of newly qualified teachers in the teaching profession in Flanders, premising the research question: "Can the newly qualified teachers' entrance into the teaching profession in Flanders be predicted/explained based on (ex ante) factual characteristics of the individual in its environment?" This report will strive to create a profile and provide sufficient intelligence on who, how and when newly qualified teachers enter the teaching profession in order to better aim future policy-adjustments. In this way, this report may facilitate the policy-makers' challenge to ensure a stable and qualitative supply of teachers.

In Flanders there are several ways in which labor market entrance as a teacher can be accomplished (McKenzie, Emery, Santiago, & Sliwka, 2004). Labor market entrance for teachers is only conditional on graduation from either of three teacher training programs, disregarding the inflow of unqualified teachers. Firstly, one can obtain an initial integrated teaching degree. This training is a labor market-oriented bachelor program provided in various university colleges across Flanders. A second type of teaching degree consists of the subject-specific teacher training (SLO), which adds one extra year after graduation in an academic master program (or some professional or academic bachelor programs). The third way to become a teacher consists of acquiring a subject-specific teaching degree (SLO) through an adult education program. In this research report we restrict the definition of newly qualified teachers to graduates from the first two types of teacher education because of data issues<sup>2</sup> on the third teacher qualification type.

This research contributes to the empirical work on career decision-making and labor market entrance decisions. The most commonly used theoretical frameworks, such as the Social Learning Theory of Career Decision Making (Krumboltz, Mitchell, & Jones, 1976) and/or Teacher Thinking Research (Rots & Aelterman, 2008; Rots, Aelterman, & Devos, 2013; Rots, Aelterman, Vlerick, & Vermeulen, 2007; Rots, Kelchtermans, & Aelterman, 2012), focus on the individuals' psychological processes, joining preferences and perceptions of the labor market situation. Most studies use quantitative research

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<sup>2</sup> Administrative databases of the Flemish Government of Education have been used. The database of the adult education programs was considered incomplete and was found to contain a considerable amount of errors. The misrepresentation of this cohort of newly qualified teachers was believed to harm rather than aid valid modeling of the data, leading to low quality, or even erroneous, results and conclusions.

designs where data is gathered after the decision has been made (i.e. ex-post) using self-reporting scales. The major drawbacks of such research practices are the possible biases in the data, due to self-perception, societal desirability of answers and the ex post character of measurements, which causes novice teachers to reflect solely on their own strengths and identify these as necessary teaching skills (Brookhart & Freeman, 1992), leading to incorrect inference on invalid data. In order to mitigate these drawbacks, we use (ex-ante) factual data in large databases, created and maintained by central governments.

Our framework for the career decisions has primarily been used in educational transition research, which has been built on Mare's (1980) research where educational transitions are modeled as sequential dichotomous continuation decisions, or as multiple parallel track decisions (Benito & Alegre, 2012; Breen & Jonsson, 2000; Lucas, 2001). In this report, we distinguish between two decision moments in time. The first decision moment is the moment of graduation from teacher training, on which the newly qualified teacher may decide to start a teaching career, pursue further higher education or start (looking for) a career outside of teaching. The newly qualified teachers who decided to pursue further higher education or return to higher education after starting (to look for) non-teaching careers are being tracked up to the moment when they definitively leave the higher education system, which is identified as the second decision moment. The final graduates only have two decision options: start a teaching career or start (looking for) a career outside of teaching.

In order to identify the determinants of this choice process, the rationale of Rasbash, Leckie, Pillinger and Jenkins (2010: 657), who base their quote on the work of Bronfenbrenner (1977), saying "children are raised in complex social environments that involve multiple layers of influence", is used. Under this rationale, the combination of the individuals' characteristics and those of their direct environment are plausible to influence their career decisions after graduation. Kennedy (2010) reinforces the proposed design by stating that overestimation of personal characteristics and simultaneous underestimation or even negligence of contextual factors, leading to a fundamental attribution error, biases results. The multilevel representation of an individual's environment alludes to the 'frog-pond'-metaphor (Hox, 2010; Owens, 2010), which focuses to the relative position of the individual with respect to his/her environment<sup>3</sup>.

The multilevel representation of the individual's environment used in this report consists of three potentially important levels; the individual level, the higher education institution level and the geographical neighbourhood level. The first level consists of the individual's characteristics, describing the 'nature' of the individual, in combination with the characteristics of their family, which are more closely aligned to 'nurture' effects. This group of characteristics includes demographics, historical education performance and parental support covariates. The higher education institution level denotes the direct (educationally) competitive environment (Owens, 2010), in which the individual attempt to excel, and consists of the higher education institution-specific characteristics and its student-body composition. The higher education institution level is more specifically identified as the higher education institution where the individual obtained his/her teaching degree. The last level is the geographical neighborhood and captures the circumstances of daily life, including demographical covariates, population composition and local labor market opportunities. Owens (2010: 301) found

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<sup>3</sup> For example: A medium-sized frog in a pond of small frogs stands out, being perceived as the most advantaged and gifted individual, whereas the same medium-sized frog surrounded by large frogs may be perceived as a misfit/disadvantaged. Since the identity of the medium-sized frog does not change, the environment has a major impact on the (self-) perception of the individual frog. This may in turn frame and influence on the individual's decisions.

that “neighborhood context may shape students’ ideas about their potential or ability, what goals are appropriate, or how to present themselves or relate to others”. Even though Owens’ (2010) quote has been oriented towards an educational attainment research question, there is no indication that the content of her quote does not hold for labor market entrants.

This report continues with an overview of the higher education system in Flanders and the modalities for labor market entrance in the teaching profession. This chapter will, as well, provide a detailed overview of the existing literature on the labor market entrance decision of newly qualified teachers. In the second chapter, the data and methodology for the empirical analyses will be described. Subsequently, the results of the multilevel models will be reported. This paper will conclude with a discussion of the results, their practical implications, limitations and recommendations for further research.



# Chapter 1. Education in Flanders: an overview

## 1.1 Knowledge and the Learning Economy

Our Western economies' foci have shifted from a production-oriented, machine-intensive industrial perspective towards a service-oriented, knowledge-intensive creativity perspective (Hodgson, 1999). The purpose of economic activity in the resulting 'Learning Economies' is not solely defined as consumption, as formerly argued by Smith (1776), but also introduces the development of knowledge and human education, as the transfer of the state-of-the-art knowledge, to ensure sustainability of future generations (Hodgson, 1999). As knowledge is created and transferred by means of education, education is deemed to be a key element to the development of knowledge-based societies (UNESCO, 2011).

The importance of education has been acknowledged in an international context. The 'Education for All'-commitment of UNESCO (2011) states already that the right to be educated is one of the most basic human rights. This right has even been incorporated into the Belgian Constitution (Art. 24, §3, eerste lid, Belgische Grondwet). This being stated, it becomes obvious that Western economies should focus on the quality and stability of their educational system. The quality of an educational system depends mainly on the quality of its teachers, since teachers are regarded as the most efficient medium for equity, access and quality in education (UNESCO, 2014).

### 1.1.1 A brief overview of the Flemish (higher) educational system

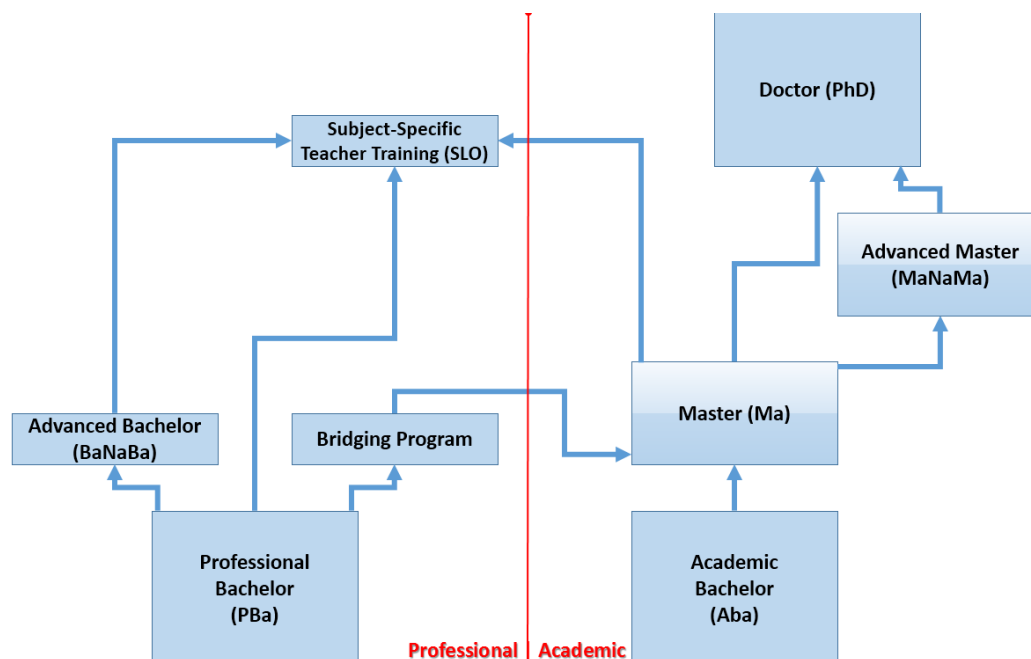
The total duration of the Belgian education is among the longest in Europe. The 'expected duration of education' takes about twenty years (European Commission, EACEA, & Eurydice, 2012). This is likely due to the high participation in (non-compulsory) kindergarten (well over 95%; European Commission et al., 2012) and the total length of the compulsory education, ranging from age 6 up to age 18 (McKenzie et al., 2004). Compulsory education consists of six years of primary education and 6 years of secondary education. The remaining five years are due to limited grade/year retention during education and relatively high participation in higher education (about 36% of all 18-year olds enroll in higher education; European Commission et al., 2012). Since it is allowed to quit education at the age of eighteen, which is not exactly equal to leaving school since tutoring at home is allowed as well, there is a strong indication that the remaining five years can be apportioned to high-school graduates entering higher education.

An overview of the higher education tracks can be found in Figure 1. This figure shows a clear distinction between professional and academic tracks at universities and university colleges. Professional bachelors are three-year programs, provided by university colleges, aimed at preparing students for labor market entrance by enhancing their professional knowledge and skills at an advanced level. Academic bachelor programs, mainly provided by universities, take three-years (180 credits) as well but rather focus on academic and theoretical abilities. The academic bachelors (180 credits) are ought to be followed immediately by enrollment in a master program, which takes at least

one year (60 credits) and focusses on a specific field of expertise and the consecutive labor market entrance. Professional bachelors can enroll in a master program only when a bridging or preparatory program has been successfully completed. After a professional bachelor, students may opt for a further elaboration/augmentation on their initial professional skills and knowledge by means of an advanced bachelor program. This program is still situated on the professional tier of higher education. For the academic tier of higher education, master graduates can opt for labor market entrance as well, or elaborate on further knowledge by an advanced master and/or doctoral program. These programs are research-oriented and are thus designed to contribute to existing knowledge by developing new knowledge. Next to the knowledge-development orientation of the academic tier, there is a knowledge-transfer orientation on the professional tier. These programs are aimed at labor market entrance as a teacher and consist of professional bachelor programs, advanced bachelor programs and subject-specific teacher training programs. They are provided by university colleges and universities. In Figure 1, the adult educational tracks of the Flemish educational system were omitted, because they will not be studied in the remainder of this report.

It, thus, becomes clear that the structure of Flemish higher education incorporates all important areas of the learning economy and the knowledge-oriented society; labor market entrance for economic activity, knowledge development by an extensive academic track and knowledge transfer by the development of subject-specific, highly skilled teachers.

**Figure 1 Higher / Tertiary Education at university (colleges) in Flanders**



### 1.1.2 Teaching Environment in Flanders

Firstly, it is important to identify the ways in which the inflow of teachers is possible. The inflow into the teaching profession as a qualified teacher is only conditional on graduation from teaching education. There are, thus, several ways in which teacher education is provided and labor market entrance as a teacher can be accomplished (McKenzie et al., 2004). A first type of teacher education is

the initial integrated teacher training (GLO). There are no specific admission requirements for teacher education other than an upper secondary education certificate. These programs are typified as 'concurrent' teacher education, meaning that students are involved in teaching practice right from the start (European Commission, EACEA, & Eurydice, 2013), building both subject-specific knowledge and general pedagogical knowledge (75% of the program content) and teaching skills (25% of the program content) (Vlaams Ministerie van Onderwijs en Vorming, 2014a). These programs are provided as professional bachelors, meaning they are labor market-oriented, take about three years (180 credits) to finish and are provided by university colleges. This teaching degree grants direct access to teaching positions in nursery, primary, lower secondary education and upper secondary education for technical and vocational secondary education only. A second type of teacher education is the subject-specific teacher training (SLO), which adds one extra year (60 credits) after graduation from an academic master program (or some professional bachelor programs), which is why this program is typified as 'consecutive' teacher education (European Commission et al., 2013). These programs are provided as a single year (60 credits) aimed mostly (at least 50% of the program content) at acquiring educational methods and teaching skills in practice, since the subject-specific proficiency is ought to have been acquired during the preliminary education (Vlaams Ministerie van Onderwijs en Vorming, 2014a). A diploma from an SLO-program grants access to secondary education, but is most commonly used to teach in upper secondary education. The last type of teacher certification can be obtained by a subject-specific teacher training in adult education (CVO). This type of teacher training used to accredit a teaching certificate (GPB; *in Dutch: Getuigschrift Pedagogische Bekwaamheid*), which allowed graduates to teach at specific levels of education (Devos & Vanderheyden, 2002), but is now (Decree of June 15th 2007; Belgisch Staatsblad, 2007) equivalent to the subject-specific teaching degree granted in the standard educational system.

Secondly, after having obtained a teaching diploma, newly qualified teachers can enter the labor market and apply for teaching positions which are dispensed through open recruitment, meaning that all schools have full autonomy to post vacancies for teaching positions (European Commission et al., 2013). The contract types and modalities of employment depend on the type of school. Almost all modalities, such as professional status, salaries and promotion/tenure requirements, are prescribed and enforced by the top level authority, the Flemish Government. The professional status of teachers is denoted as (assimilated) 'civil servant' or (assimilated) 'career civil servant' if the teacher is tenured. The actual salary is determined by the preset salary scales linked to the professional status. The minimum requirements for promotion or tenure eligibility are enforced by the Flemish government as well. These requirements concern thresholds on teaching time and duration of continuous employment on courses or teaching assignments and depend on the subject and level of teaching (Vlaams Ministerie van Onderwijs en Vorming, 2014b). The amount of teaching hours, teaching subject and length of employment are recorded in the contract. Currently, 81% of all teachers are permanently employed, only 4% of all teachers are employed on a temporary basis for a period of more than one year, while the remaining 15% consists of temporarily employed teachers assigned for less than one year. This implies that newly qualified teachers will probably end up with temporary contracts in the early stages of their working careers, which might induce some uncertainty with respect to continuity of employment. However, if they comply with the promotion requirements, they can become 'tenured', which grants certainty of employment for a specific assignment (Devos & Vanderheyden, 2002; McKenzie et al., 2004).

Thirdly, the professional environment in which teachers have to work is of interest. Since there is no formal limit on the number of students in schools, teachers are often occupied people. In practice,

class sizes range from twelve to twenty-four students per class (European Commission et al., 2012). The average pupil-to-teacher ratio lies around 11 (13 for primary education teachers and 9 for secondary education teachers), which seems manageable (European Commission et al., 2013). However, if there is a high proportion of 'special needs' students (GOK), the required effort per student on behalf of the teacher rises considerably (the school acquires extra funding). The teaching workload is usually contractually set. Seventeen up to twenty-three hours are spent on actual teaching duties, whereas nursery and primary education teachers are required to be available at school for twenty-six hours whereof twenty up to twenty-three hours are spent on actual teaching duties (European Commission et al., 2013). An important aspect of the work environment is the support schools provide to their teaching staff. Schools have full autonomy in the decisions about the amount and types of support provided to newly qualified teachers and existing teachers (European Commission et al., 2012). In order to continuously (re)develop the existing teaching staff, by enhancing subject-specific and pedagogical skills, continuous professional development (CPD) programs are provided free of charge (European Commission et al., 2013; OECD, 2014). The school, who pays for the non-priority professional development programs, are provided with a budget by the government. These programs are not compulsory. Due to a lack of incentives to follow these programs, teachers don't experience any 'need' for CPD programs and tend to underestimate their advantages (OECD, 2014; Vlaams Ministerie van Onderwijs en Vorming, 2009).

Fourthly, the demographical composition of the existing teaching staff will be briefly described. About 3.5% of the whole active population in Belgium consists of teachers, which is well above the European average of 2.1% (European Commission et al., 2013). With respect to the gender distribution of the teaching profession, a persistent trend of feminization has been found; 80% and 67% of teachers in primary and secondary education respectively, are female (European Commission et al., 2012, 2013). In higher education, the inverse distribution has been found, where only 43% of tertiary education teachers are female (European Commission et al., 2012). The gender inequality can be explained using the results of King (1993) finding that males give higher importance to salary, prestige, security and career advancement opportunities. These preference profiles were found to be indicative for non-teachers by Shipp (1999). Inequalities also exist regarding the age distribution of the teacher population (European Commission et al., 2012, 2013). In primary education, the teaching staff are quite evenly distributed: 23% (age < 30), 29% (30-40), 27% (40-50) and 21% (age > 50). In secondary education, the teaching staff is clearly greying: 16% (age < 30), 25% (30-40), 26% (40-50) and 33% (age > 50). When confronted with a greying teaching staff, retirement is not a trivial issue anymore. Retirement is found to occur evenly over time, which avoids heavy shocks in the teacher supply. However, teachers still tend to retire as early as possible; actual retirement age is 58, even while minimum retirement age lies at the age of 60 (officially 65). On average, this implies an employment duration of 41 years (European Commission et al., 2013). The teaching staff was found to become more ethnically diverse, even though the majority of the teaching staff tends to remain primarily white (Guarino, Santibanez, & Daley, 2006). Another aspect of the current teaching staff is the, somewhat troubling, statement that the teaching force is not composed of the brightest and most academically able graduates (Guarino et al., 2006; Pigge, 1985), even though this characteristic is not considered as the most important criteria for hiring a teacher (Ballou, 1996).

## 1.2 Research Questions

### 1.2.1 Relevance

As noted in the introduction, the learning economy is still an economy as such. The core laws of economics do apply on this market of knowledge as well, meaning that the market can be represented, on a macro-economic level, as the equilibrium between supply and demand. There is an incessant demand for knowledge, since this provides the necessary comparative advantages for players in the economic system by means of quality and efficiency of decision-making. This knowledge can be regarded both as extensive knowledge discovery and the development of insights in market mechanisms and processes (research) and as the development of new products and processes (innovation). The supply of knowledge depends on the quality and quantity of highly educated agents, which are the product delivered by the educational system. On the micro-economic level, this supply and demand paradigm holds as well. The educational system tends to provide high-quality education for all children, which is a basic human right (UNESCO, 2011). However, this basic right cannot be taken for granted. The demand for teachers is driven by pupil enrollment, class-size targets, teaching load norms and budgetary constraints of the system itself (Guarino et al., 2006). Since pupil enrollment is highly stimulated, especially in light of the knowledge-oriented economic environment, the demand is expected to increase or at least level out. Nonetheless, the supply, which is determined solely by the available teaching force, is desired to meet the increasing demand. Any inability to meet demand, creating an imbalance between supply and demand, will have serious quantitative and qualitative implications for the educational system.

In several Western countries, large portions of the current teaching force are approaching retirement age (Huyge et al., 2009; Johnson, Berg, & Donaldson, 2005). When these greying teachers leave the profession, the supply will face a sudden drop. Meanwhile, teaching seems to become less attractive relative to other job opportunities (Johnson et al., 2005; Pigge & Marso, 1992), possibly because of uncertainty, high workload and limited growth opportunities (Huyge et al., 2009), which restricts supply. Moreover, it has been irrefutably noticed that many young teachers leave the teaching profession quite early, for which teaching has been depicted as a 'revolving-door'-occupation by Ingersoll (2001). This high turnover prohibits the development of a stable teaching force and has noxious effects on the quality of education.

In Flanders, it has already been noticed that there is a (growing) shortage of teachers. Rots, Aelterman, Devos & Vlerick (2010) attribute this shortage to lacking recruitment (too few high school graduates entering teacher education), scanty job entrance (too few teaching graduates entering the teaching profession (Johnson et al., 2005)) and ample attrition (too many young teachers leaving the profession after a short period of time). Recent studies reported that about one third of students studies in schools with a lack of qualified teachers for bottleneck-subjects such as sciences, mathematics and languages (European Commission et al., 2012).

UNESCO states that teacher education, recruitment, retention and working conditions are among their top priorities (UNESCO, 2014). In order to maintain and develop the educational system's quality, national policy-makers should take these priorities to heart as well. Huyge et al. (2009) identify the main challenges as the need for some breath of fresh air for schools, by attracting young, proficient and motivated newly qualified teachers, and the retention of the high potentials and proficient

professionals. The teaching profession should be tailored a new suit of attractiveness, balance, proficiency and expertise and should get rid of the self-depriving image caused by the suing culture (Huyge et al., 2009).

### 1.2.2 Research Question

The inflow in teacher education is an important descriptor and/or predictor of the potential teacher population. However, educational choices are not equal to occupational choices. Not all newly qualified teachers will actually enter the teaching profession. The choice whether teaching graduates enter the teacher profession or take advantage of alternative opportunities, such as non-teaching occupations and/or further education, is the principal subject of interest for this research report. The analysis of occupational decisions of (teaching) graduates is primordial to develop insights and knowledge about future labor market challenges.

In Belgium, the average job entrance of teaching graduates of integrated teacher education, subject-specific teacher education and adult teacher education amount to respectively 81%, 33% and 49% (Vlaams Ministerie van Onderwijs en Vorming, 2013). These results indicate that the majority of the teaching graduates, who initially chose to start teacher training, will start a teaching career. Only half of the adult teacher education graduates start a teaching career, which may be due to the fact that these people were already planning a change of career and followed teacher education to 'keep their options open'. The job entry rate of teaching graduates from subject-specific teacher education is very low. Of course, these graduates have already obtained a subject-specific diploma and are thus confronted with many alternative career opportunities.

Guarino et al. (2006: 175) stated: "Individuals will become [...] teachers if teaching represents the most attractive activity to pursue among all activities available to them", which means that occupational choices are based on a reflection on the desirability of a profession relative to alternative career opportunities. This desirability and attractiveness can be based on compensation (i.e. salary and diverse benefits (Dolton, 1990)), working conditions and personal satisfaction (Guarino et al., 2006). Unfortunately, the teaching occupation has already been found to lose attractiveness relative to other job opportunities (Johnson et al., 2005; Pigge & Marso, 1992). Building on an extensive literature review by Guarino et al. (2006) teachers admitted that their choice to become a teacher has been based on the fact that the teaching job matched their criteria; you must love the job, the job has to allow you to spend time with your family (i.e. work-life balance) and the job has to contribute to society and attempt to help others. These criteria tend to match with the teaching profession (Matheus et al., 2004). Non-teachers tend to describe the teaching occupation as a job where you are in an unsafe and unrewarding position since teachers are regarded as scapegoats for all educational problems by students, parents and the school itself, while being largely underpaid (Guarino et al., 2006). Non-teachers tend to focus more on salary, prestige, security and advancement opportunities (De Cooman et al., 2007; Shipp, 1999), which are criteria on which the teaching profession is not very attractive (Huyge et al., 2009; Kyriacou & Coulthard, 2000). Cairns, Almeida and Vieira (2012) found that student teachers' perceptions on career aspects, such as personal sense of fulfilment and competence as a teacher, is relatively high, but that they are unsatisfied with the emotional and physical impact of the teaching profession, meaning that being a teacher is a stressful and demanding profession.

The explicit research question, which is central to this research report, can be formulated as follows: “Can the newly qualified teachers’ entrance into the teaching profession in Flanders be predicted and/or explained based on (ex ante) factual characteristics of the individual in its environment?”

The focus of most models and theoretical frameworks on occupational decision making lies primarily on the individuals’ psychological processes, joining preferences and perceptions of the labor market situation. These models require large amounts of quantitative data, obtained through self-perception surveys, and/or qualitative data gathered using interviews and narrative diary studies. The use of self-reporting scales suffer from drawbacks such as self-perception bias, social desirability deflection and lagged observation. Furthermore, few researches explicitly control for demographic characteristics and environmental variables, but tend to use them solely to describe and/or validate their sample. Neglecting the impact of contextual/environmental variables has been found to cause bias in contemporary research, due to overestimation of personal characteristics and underestimation of contextual effects (Kennedy, 2010). Most of the demographic and environmental variables can be found in secondary (administrative) databases, often created and maintained by central governments. These factual data may be less biased, because they are not based on self-perception.

### 1.3 Theoretical Perspectives on (Teacher) Job Entrance

The overview of the most commonly used theoretical frameworks on career decision making, which will be reviewed and explained in detail within this section of this paper, will be based on three overarching theoretical frameworks applying several underlying theories. Firstly, the social learning theory of career decision making, based on the work of Krumboltz, Mitchell and Jones (1976), will be discussed. This theoretical framework has been adapted to the specific teaching profession context by Rots and Aelterman (2009) and applied by Rots et al. (2010). Secondly, the specific focus will shift to motivations and beliefs about professions as determinants of career decisions, which has been soundly applied to the teaching context as ‘teacher thinking research’ (Rots & Aelterman, 2008; Rots et al., 2013; Rots et al., 2007; Rots et al., 2012). Subsequent to the review of motivational literature on career choices and its application on teaching careers, the FIT Choice Model, developed by Watt and Richardson (2007, 2008), will be discussed in detail. A fourth and last subsection will introduce the few results and models on career changers, which can be denoted as ‘sideways’ inflow into the teaching profession.

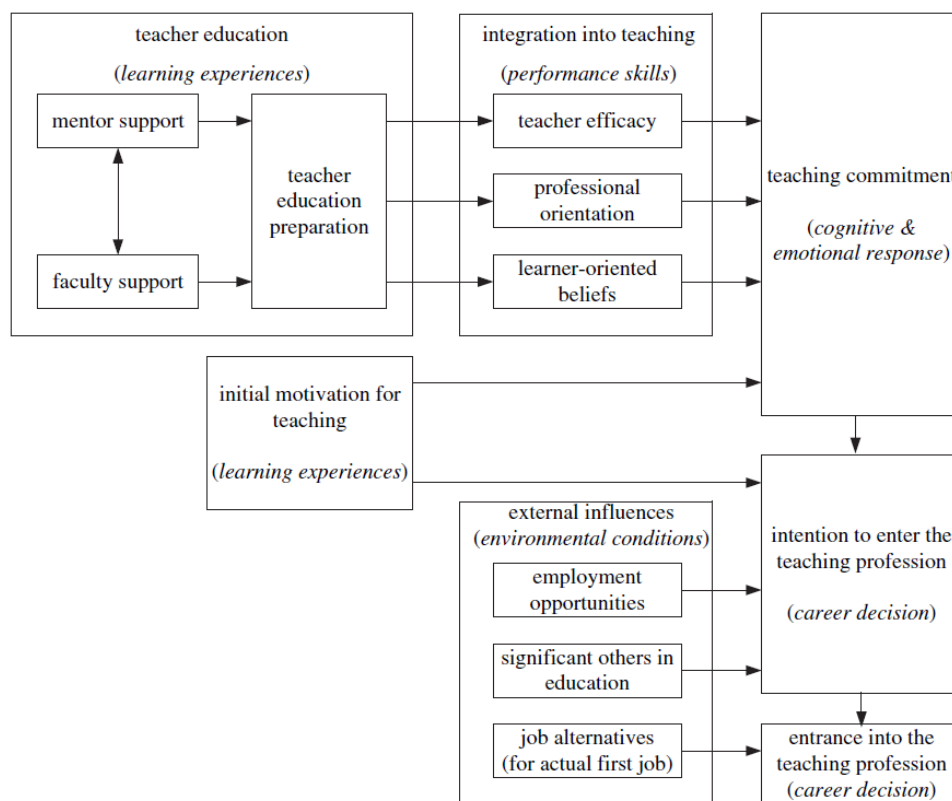
#### 1.3.1 Social Learning Theory of Career Decision Making

The Social Learning Theory of Career Decision Making, established by Krumboltz et al. (1976), frames the career decision as a contextual process identified by interactions between genetic factors, environmental conditions, learning experiences, cognitive and emotional responses, and performance skills. The decision process is depicted as a sequence of decision points over time. At each decision point, the individual is ought to choose between multiple options. The nature and number of these options are influenced by internal and external factors. The internal factors, or personal factors, can be described as genetic endowment and abilities and consist of demographical factors (e.g. gender and ethnicity), physical and intellectual abilities or constraints (e.g. intelligence, abilities and/or handicaps). These internal factors are mainly innate factors and are assumed to be present a priori to the process of career decision making. The external factors can be split up in three categories:

environmental conditions and events, learning experiences and task approach skills. The environmental conditions summarize the socioeconomic environment, political and institutional frameworks of both the local labor market and the educational system, and location specific characteristics of the individual. Events reflect the number and nature (i.e. type, match and rate of return) of alternative educational and occupational opportunities. Learning experiences can occur as an instrumental experience, where problem-solving actions are executed and, in turn, generate an emotional and cognitive response depending on whether the actions led to success or failure, or as an associative experience, where the environment emits a stimulus and the observing individual emotionally and/or cognitively responds to the respective stimulus. Task approach skills denote the way in which the individual approach a specific task with his/her given skill set, habits and emotions and generates an efficient solution/performance strategy. The interactions between internal and external factors create the environmental setting in which the individual makes a career decision. For various examples of the application of this social learning theory of career decision making, we refer the reader to the article of Krumboltz et al. (1976).

The most interesting aspect of this social learning theory of career decision making is that it can be soundly applied to specific career choices, including the teaching profession. Chapman (1983) has applied this model on teacher retention/attrition, while Rots and Aelterman (2008, 2009) and Rots et al. (2010; 2007) elaborated on specific elements of the model and succeeded in extending the model to the entrance into the teaching profession (see Figure 2). Most of the aspects of the social learning theory have been specified in a concrete teaching context. In the next paragraph, all different constructs will be identified and explained.

**Figure 2 Hypothetical Model on Teaching Profession Entrance**



Source: Rots et al. (2010: 1621)

Learning experiences are mainly quantified using several teacher education constructs. Initial support during teacher education contributes to the feeling that teacher education has prepared graduates for the demands of teaching. This teacher education construct determines some of the abilities of the teaching graduates, which are considered as personal factors as well. These constructs may as well be correlated with the initial motivation for teaching, which has been found to be an important determinant of the teacher career decision (Jarvis & Woodrow, 2005). Rots et al. (2010: 1619) clearly state that “it can be assumed that most student teachers start their teacher education with a more or less explicit motivation to become teachers”. This motivation is shaped and refined during teacher education and the first years of teaching (Rots et al., 2012). This process will be elaborated on below.

The skills and abilities, which were developed during teacher education, need to be integrated into teaching. This integration into teaching, corresponding to what Krumboltz et al. (1976) denoted as task approach skills, are quantified as self-perceived skills and abilities as a teacher (Rots et al., 2010). The self-perception eventually leads to the measurement of constructs such as ‘teacher efficacy’, ‘professional orientation’ and ‘educational beliefs’ (Rots et al., 2010). Both initial motivation for teaching and integration into teaching are hypothesized to have a positive effect on teaching commitment, which is congruent to the cognitive and emotional response to learning experiences in the social learning theory (Krumboltz et al., 1976).

Together with teaching commitment and initial motivation, there are external influences which have an impact to the career decision. These external influences are specific operationalisations of the environmental conditions and events in the social learning theory of Krumboltz et al. (1976) and consist of labor market/job opportunities and peer-influences (Rots et al., 2010). The labor market opportunities captures all career alternatives after graduation in teacher education, while peer-influence focuses on the potential influence of significant others (e.g. family members or friends working or having worked in education).

The actual career decision, which is the dependent variable in the empirical social learning model, has been split up into intention to enter the teaching profession and the actual entrance decision into teaching profession (Rots et al., 2010). This rationale corresponds to behavioral intention models such as the Theory of Planned Behavior (Ajzen, 1991; Ajzen & Fishbein, 2000). This theory of planned behavior is conceptualized as a model where the three concepts, ‘attitude towards behavior’, ‘subjective norm’ and ‘perceived behavioral control’, and their interactions have an effect on behavioral ‘intention’. Given that the individual has the ability to perform the behavior, encompassing both volitional control and resource availability, the behavioral intention will positively influence behavior since they “are assumed to capture all motivational aspects that influence a behavior” (Ajzen, 1991: 182).

The critical concepts affecting behavioral intentions result from a direct application of the expectancy-value theory (Eccles et al., 1983; Eccles & Wigfield, 1995; Wigfield & Eccles, 2000), which is based on the interaction between subjective values of the behavior and the beliefs on how well the specific behavior will be performed. This model will be discussed in more detail later on, but the constituents of the underlying factors of the theory of planned behavior will be discussed in this paragraph. Attitude towards behavior results from the appraisal of the potential outcomes of the behavior. The appraisal is computed by the multiplication between salient belief (i.e. the subjective probability that the behavior will produce the specific outcome) and the subjective evaluation of the outcome (Ajzen, 1991). The subjective norm, interpretable as the social pressure on the performance of the behavior,

results from the multiplication of a normative belief and motivation to comply with them. The perceived behavioral control, specifying the ease or difficulty of performing the behavior, results from the multiplication of the belief or being in control of the individual's behavior and the perceived power of the control.

### 1.3.2 Teacher Thinking Research

In the application of the social learning theory of career decision making on the teaching profession by Rots et al. (2010), the initial motivation for teaching was included as a learning experience. It has been found that teaching graduates differ in their motivation to start a teaching career (Jarvis & Woodrow, 2005), which makes it likely that initial motivation for teaching is related to this career choice as well (Rots & Aelterman, 2009; Rots et al., 2010). Motivations and beliefs are found to be shaped and adapted during teacher education and the first experiences in teaching (Rots et al., 2012). This focus can be denoted as 'Teacher-Thinking Research' (Rots et al., 2012). The decision whether or not to become a teacher results from a continuing process of professional development from social interactions (Kelchtermans, 2005). Rots et al. (2012) identify three major types of social interaction contexts. Firstly, there is the initial professional preparation, which is equivalent to teacher education, providing the necessary knowledge and skills to become a successful teacher, but also create the primordial self-understanding as a teacher (Pop & Turner, 2009; Rots et al., 2012). This self-understanding consists of five components; (i) self-image, being the description of oneself as a teacher, (ii) self-esteem, being the evaluation of the one's performance as a teacher, (iii) task perception, being the normative perception of the performance of a sufficiently successful teacher, (iv) job motivation, being a conative component (i.e. driving actual behavior) defining the motivation to become a teacher, and (v) future perspective, revealing the expectations about oneself in the future. The second type is the occurrence of critical incidents/events, phases and people, which affects the self-perceptions in the previous factors. The third type of influential interaction is denoted as the 'praxis shock', which indicates the discrepancy between theory in education and the practice in the occupation. It should be noted that the creation of a competent teacher profile, the socio-professional relationships with colleagues and the fit of the individuals' norms and values with the school culture, which is defined as "the basic assumptions, norms and values, and cultural artifacts that are shared by school members" (Maslowski, 1997: 5), depend on self-perception and perception of others in the environment. In this way, the influential social interactions are double-edged swords, which might contribute to motivation and intention to start a teaching career, or (partially) destroy it (Rots et al., 2012).

The importance of values and beliefs on the career decision making process has been found to be an attractive theoretical point of view for many researchers. The impact can be hypothesized based on the Expectancy-Value Theory (Eccles et al., 1983; Eccles & Wigfield, 1995; Wigfield & Eccles, 2000). This expectancy-value theory has been designed to research school enrollment patterns, but it can be applied to teaching career choices. Career choices can be determined by the combination of subjective value of the career decision, consisting of intrinsic (i.e. teaching enjoyment), utility (i.e. usefulness of the teaching job) and attainment (i.e. subjective importance of performing well) values and costs (i.e. opportunity costs), and both current and future beliefs in the individuals' abilities as a teacher (Eccles et al., 1983; Watt & Richardson, 2007). De Cooman et al. (2007) focused on the conceptual differences between work values and job motives. Work values are cognitive representations of needs, reflecting enduring standards that determine behavior (Rokeach, 1973), while job motives can be defined as "learned needs which influence our behavior by leading us to pursue particular goals because they are

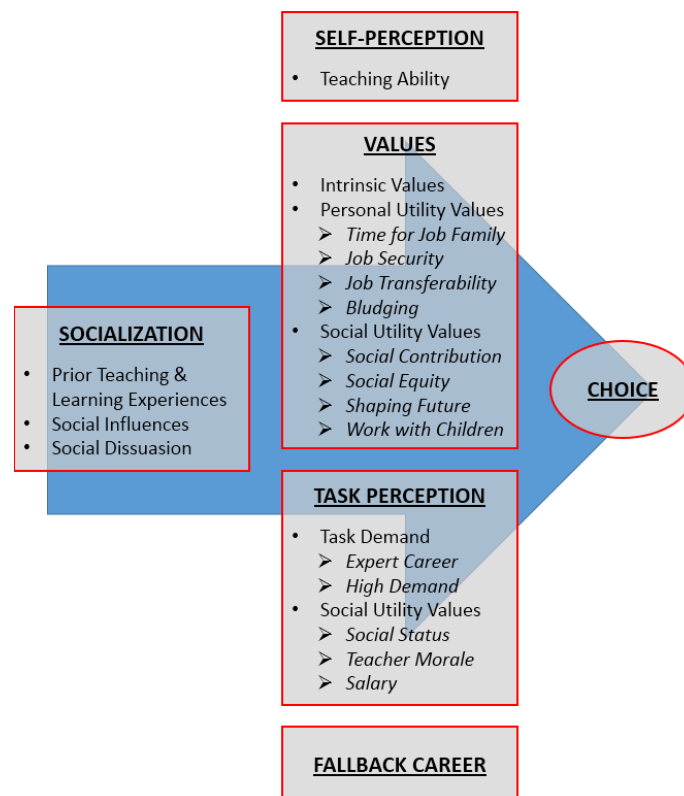
socially valued” (Buchanan & Huczynski, 1997: 71). In the specific context of teaching career choices, value constructs can be approximated by motives and motivational factors.

Motivations for pursuing a teacher’s career can be divided into three broad categories; intrinsic, extrinsic and altruistic motives (e.g. De Cooman et al. (2007), Jungert, Alm and Thornberg (2014), Kyriacou and Coulthard (2000), Manuel and Hughes (2006), Pop and Turner (2009) and Thomson, Turner and Nietfeld (2012)). Intrinsic motivations involve aspects that are inherent to the specific job activity, such as the love for teaching children and passion for the subject-specific knowledge/expertise. Extrinsic motivations are rather instrumental motives and are not inherent to the specific job. Examples of extrinsic motivations are monetary rewards and non-monetary rewards, such as holidays and job security. Altruistic motivations focus on the worth of the job, which is often defined in terms of the perceived importance of making a valued contribution to society. Altruistic and intrinsic motivations are found to be the most important motivations for beginning teachers, while extrinsic motivations hardly matter for teaching graduates (De Cooman et al., 2007; Kyriacou & Coulthard, 2000; Manuel & Hughes, 2006; Thomson et al., 2012). Manuel and Hughes (2006) relates this finding to the notion of ‘teaching as a calling’, which holds even when applicants are aware of the negative aspects of the teaching occupation. Even though extrinsic motivations are not important for choosing a teaching career, they may still have some impact on the decision to continue teaching in the future (Manuel & Hughes, 2006). The demographic inequalities in the teaching population, consisting of a gender inequality and an ethnic inequality, can mostly be explained using this motivation approach. Jungert et al. (2014) found that female teacher graduates score highest on altruistic motivation scales, while males score higher on extrinsic motivation scales, which agrees with the results of King (1993). Analogously, minority group members were driven by extrinsic motivations (King, 1993; Shipp, 1999).

### 1.3.3 Factors Influencing Teaching Choice (FIT Choice)

A critique on the motivational literature is that the “various operationalisations of the intrinsic, extrinsic and altruistic motivations have resulted in a lack of definitional precision and overlapping categorizations from one study to another” (Watt & Richardson, 2007: 168). Building on the theoretical and empirical (i.e. factor-analytical) foundations of the expectancy-value model by Eccles and Wigfield (1995)(1995)(1995)(1995)(1995), Watt and Richardson (2007, 2008) have developed a validated scale on Factors Influencing Teaching Choice, which resulted in the identification of three factors: expectancy/ability-related beliefs, subjective task value and perceived task difficulty. The expectancy/ability-related belief factor, denoted as ‘self’ by Watt and Richardson (2007), was based on self-perceptions of ability, success expectancy and perceived performance. The subjective task value, denoted as ‘value’ by Watt and Richardson (2007), consisted of an intrinsic interest component, an extrinsic utility value component and an attainment value component. The perceived task difficulty factor, denoted as ‘task perceptions’ by Watt and Richardson (2007), contained both perceived difficulty as the amount of effort needed to perform well on the task. For each of these three factors, several subcomponents were created and condensed into a workable scale and theoretical framework (see Figure 3).

**Figure 3 Factors Influencing Teaching Choice (FIT-Choice) Model**



Source: Watt & Richardson (2007) and Fokkens-Bruinsma & Canrinus (2012)

In Figure 3, the career decision making process starts with a socialization construct, capturing prior teaching and learning experiences, which can be directly related to the social learning theory of career decision making (Krumboltz et al., 1976), and social influences and dissuasions, which are closely related to the impact of ‘significant others’ on career choice in the model social learning theory application on the teaching profession (Rots et al., 2010). The middle plane of Figure 3 contains the articulation of the three factors from the expectancy-value theory and an extra fallback career construct. Firstly, the self-perception construct only contains the individuals’ perception of their own teaching ability. Secondly, the value construct contains intrinsic values, subjective attainment values and utility values. The intrinsic values are operationalized using assessment of interest and desire for a teaching career. The subjective attainment values, relabeled as personal utility value because these values are considered to be important in terms of the individual’s personal goals (i.e. quality of life), contains the importance of job characteristics such as ‘allows time for family’, ‘job security’ (i.e. reliable income and stable career path), ‘job transferability’ (i.e. employability) and ‘bludging’ (i.e. tendency to choose for the easiest option). These personal utility values can be classified as extrinsic motivations in the motivational framework on career decision making. The utility values, relabeled as social utility values, can be classified as altruistic motivations, such as the desire to contribute to society, enhance the social equity by transferring benefits to the socially disadvantaged, shape the future of young children through education and the love of working with young children. The extra fallback career construct reflects “the possibility of people not so much choosing teaching, but rather defaulting to it” (Watt & Richardson, 2007: 174).

The FIT-Choice model has been successfully applied in empirical research to quantify teaching career choice motivations and perceptions of several teaching career aspects in a reliable way (Eren & Tezel, 2010; Fokkens-Bruinsma & Canrinus, 2012; Kılınç, Watt, & Richardson, 2012; Watt & Richardson, 2007, 2008). The scale has been tested and validated in international contexts (Eren & Tezel, 2010; Fokkens-Bruinsma & Canrinus, 2012; Kılınç et al., 2012; Watt et al., 2012). Fokkens-Bruinsma and Canrinus (2012) investigated, in a Dutch context, how motivations for pursuing a teaching career are related to effort, involvement and commitment to the teaching profession. They found that belief in teaching abilities, intrinsic values and the desire to make a contribution to society (i.e. social utility value) were the most important constructs, while fallback career perceptions were the least important. Kılınç et al. (2012) find that the fallback option is important in Turkey, which is probably caused by the institutional policy of achievement-based entry requirements in higher education. This finding highlights the need for taking institutional and other environmental variables into account.

Watt and Richardson (2008) find three robust profiles of beginning teachers; highly engaged persisters, highly engaged switchers and lower engaged desisters. The highly engaged persisters' intentions are to remain in teaching all their lives because they have a passion for teaching and teaching fits well with family-life aspirations. The highly engaged switchers like teaching on the short run, but do not experience teaching as their life goal. This is why these people search for alternative occupations to pursue their real motivations and personal development aspirations, after which they will quit the teaching profession. Lower engaged desisters become dissatisfied and demotivated by the teaching activity, because it is too demanding or because of the lack of growth opportunities (i.e. negative task perception).

Building on the results of Watt and Richardson (2007), Eren and Tezel (2010) combined the FIT-Choice scale with a professional engagement and career development aspirations-scale (PECDA-scale), quantifying planned effort, persistence and development and leadership aspirations, and the future time perspective-scale (FTP-scale), containing achievement/performance, motivation/engagement and professional expectations. Future time perspective, defined as the "mental representation of future [...] reflecting personal and social contextual influences" (Leonardi, 2007: 17), has been found to be an important mediator on the impact of effort and persistence on the FIT-Choice measures.

#### 1.3.4 Career changes into the Teaching Profession

An additional consideration that has to be made in the occupational choice literature, is the inflow from career changers. The existing literature dedicated to this type of 'sideways inflow' into the teaching profession is very scarce or very shallow. The topic has already been initiated when considering the fallback career option. Manuel and Hughes (2006) argue that the members of 'Generation Y', which is the generation currently (about to) enter(ing) the labor market, are characterized by the search for fast promotions, new challenges and high job satisfaction. The combination of these factors will probably cause this generation to change jobs more often. A specific inquiry into the first career preference of beginning teachers has shown that more than forty percent of the starting teachers did not rank teaching as their number one career choice. However, they did prefer careers for which similar skills and values were required as those needed in the teaching profession (e.g. high commitment, interpersonal contacts, service-based and high creativity).

Priyadharshini and Robinson-Pant (2003) conducted specific research on career changers and their motives to change careers to start teaching. They discerned six profiles of career changers; 'parents', who change careers due to changes in the family structure, 'successful careerists', who stop a successful career to start teaching disregarding a drop in salary and/or status, 'freelancers', who engage themselves in several short-term contracts on the same job, 'late starters', who people who started working before they enrolled in higher education, 'serial careerists', who have a tendency to frequently change jobs, and 'young career changers', who are looking for a more suitable job while having a temporary occupation. Guided by these career changers' profiles, Priyadharshini and Robinson-Pant (2003) identify the five most important reasons to switch careers. A first reason is dissatisfaction with the previous career, resulting from feelings of boredom or social isolations. Teaching is regarded as a more sociable, stimulating and community-oriented profession. Secondly, there is the need for greater stability and security. There is some doubt whether teaching is regarded as an improvement on the current situation, since the use of temporary contracts is no exception in the early teaching career (Devos & Vanderheyden, 2002; Huyge et al., 2009; McKenzie et al., 2004). A third reason lies in the changing perspectives on life, often expressed as the desire to educate oneself further or the rising desire to work with children. The fourth reason is related to memories and experiences during the changers' own education, resulting in the desire to replicate their own positive experiences and improve on their own negative experiences at school. The fifth and last reason was the need to use subject-specific expertise, which has been developed and/or refined on the previous occupation, and transfer it to the new generations.

Laming and Horne (2013) found a different categorization of reasons for a career change to teaching, an altruistic reason, coming from the rising desire to give something back to society, a pragmatic reason, judging the job acceptability, and personal reasons. The personal reasons can be split into vocational reasons and serendipitous reasons. The former consists of being haphazardly drawn to the teaching occupation (i.e. 'converting') or the manifestation of a long-lasting interest in the job (i.e. 'homecoming'). The latter personal reason defines the situation in which the career changer never considered teaching until he/she were introduced to the teaching profession through a close personal relationship.

# Chapter 2. Data & Methodology

## 2.1 Data

The data used in this report are subsets of recently linked administrative data provided by the Flemish Ministry of Education. The linked databases consist of rich data on educational administration of students and teachers. This enabled us to consider the transition from higher education to graduation, up to the moment of labor market entrance. Our specific interest goes to the labor market entrance as a teacher. The higher education dataset contains information on both individual characteristics (e.g. gender, nationality, year of birth and place of residence) and detailed information about the individual's enrollment in higher education (e.g. education type, subject, credit accumulation and higher education institution). The full population of people who have obtained a teaching degree in the standard educational system (i.e. adult education degrees were removed) in the time period between academic years 2005-2006 and 2013-2014, were included in the dataset. The teacher occupation dataset contains detailed information on all teaching assignments (i.e. 766 748 distinct assignments) starting from 1995 up to 2014 (and continuing to the future). We obtained information on type of assignment, teaching subject, teaching hours, school number, seniority and various other administrative details. In this way, we are able to link both datasets and discover which newly qualified teachers enter the teaching profession.

The data selection process is depicted in Figure 4. From the full population of students, containing 34 742 teaching graduates, we only considered the students who have obtained a teaching degree between 2006 and 2013, leading to a sample of interest of 34 431 qualified teachers. This enables us to consider labor market entrance within one year from graduation. Furthermore, 2 470 graduates were excluded from the sample due to the fact that they had already been employed as a teacher and, thus, cannot be considered as 'newly' qualified teachers.

The relevant subpopulation for the first model, which models the labor market entrance at the moment of graduation from the teaching degree, contains 31 961 newly qualified teachers. As has already been noted in the previous section of this report, we consider three distinct decision options, being: start a teaching career within one year of graduation ( $n = 20\,084$ ; 63% of the sample), continue further education immediately after graduation<sup>4</sup> from the teacher training ( $n = 6\,597$ ; 21% of the sample) or start (looking for) a job outside of teaching ( $n = 5\,280$ ; 16% of the sample).

Those teaching graduates who continue higher education, and a subset of the graduates who formerly started (looking for) a non-teaching occupation but have returned to higher education ( $n = 762$ ; only 14% of the subset), are tracked in higher education up to the moment of final graduation. Once again, we only withhold those qualified teachers who finished higher education before 2014, because of identifiability considerations. We removed those graduates who were already in teaching positions (see footnote 3) from the considered subsample, resulting in 3 163 definitive labor market entrants.

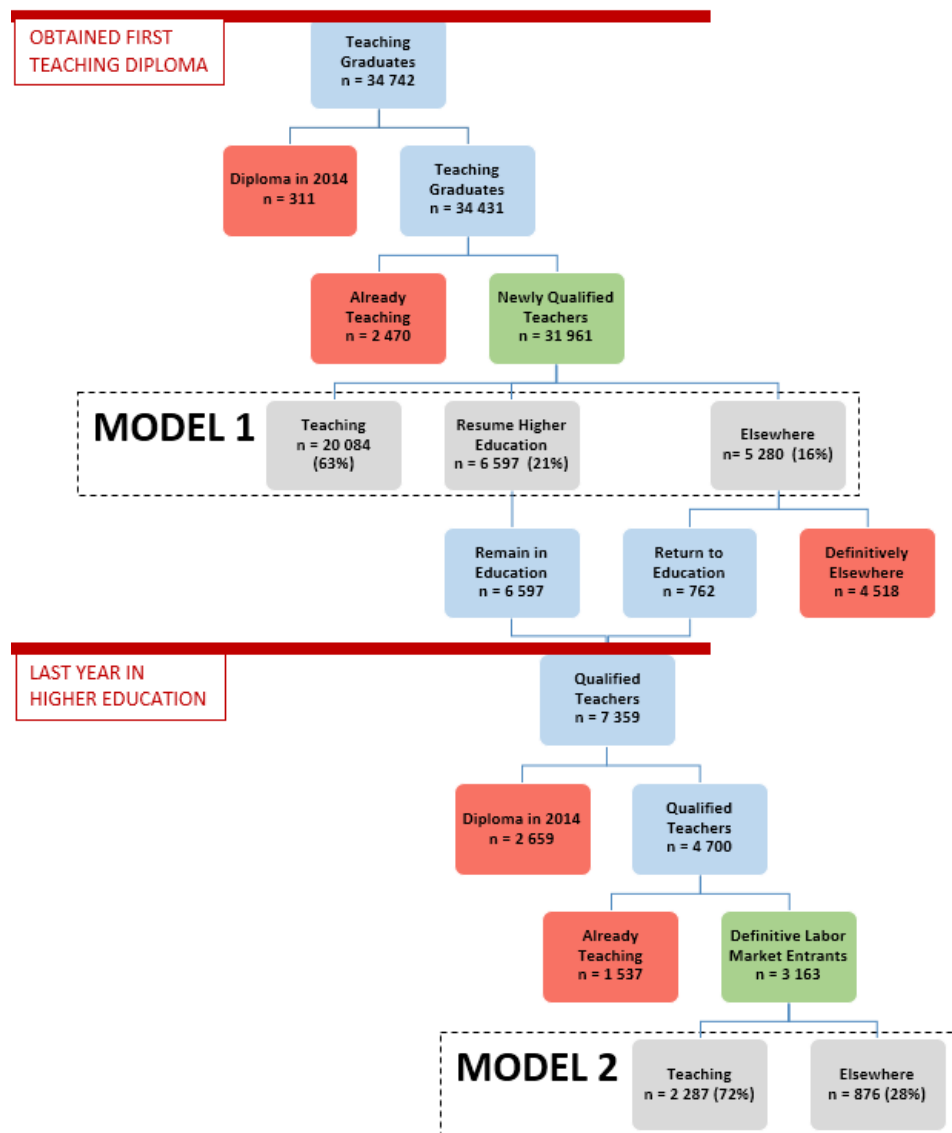
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<sup>4</sup> Newly qualified teachers who simultaneously start working as a teacher and continue in higher education ( $n=2\,869$ ) are considered to be 'continuing higher education', under the assumption that continuing higher education is so time-intensive that it will be their main activity.

Since the individuals cannot, by definition, pursue further higher education, they are left only two decision options: start a teaching career (n = 2 287; 72% of the sample) or start (looking for) a job outside of teaching (n = 876; 28% of the sample).

Based on this data selection process, we can see that of the full dataset (i.e. 34 742 individuals) 26 378 teaching graduates (i.e. about 75.9%) have entered the teaching profession and 5 394 graduates (i.e. about 15.5%) have not yet entered the teaching profession. The labor market entrance of the remaining 2 970 individuals (i.e. about 8.5%) could not be identified up to now (because of graduation in 2014).

**Figure 4 Data Selection Process**



## 2.2 Research Design and Methodology

In the introduction of this report our modeling framework for career decisions originated from education transitions research by Mare (1980), which means that transitions are modeled as sequential dichotomous decisions, or as multiple parallel track decisions (Benito & Alegre, 2012; Breen & Jonsson, 2000; Lucas, 2001). Therefore, we will use a multinomial logistic regression model for the first decision moment, since this decision consists of multiple unordered decision options, and a binomial logistic regression model for the second and final decision moment, since the decision here becomes dichotomous.

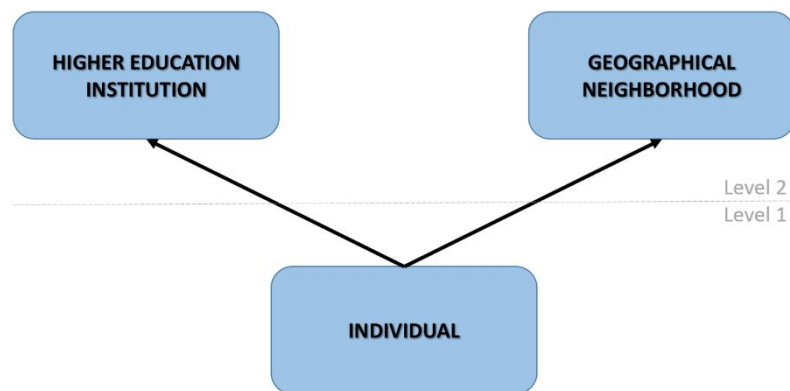
When recalling the multilevel representation of the individual's environment as the 'frog-pond'-metaphor (Hox, 2010; Owens, 2010), the data are assumed to follow a rather complex structure. This complex structure deviates somewhat from the regular data structure. Hence, the analysis framework should be adapted to incorporate this complex data structure in order to obtain valid inference, resulting in multilevel modeling approach. In the remainder of this subsection, the multilevel analysis framework will be described and the analysis strategy will be explained.

### 2.2.1 Data Structure

The data structure of our dataset is considered to have a complex nesting structure. The observed individuals are nested in higher education institutions, meaning that multiple individuals study at the same institution. The figurative 'frog-pond' in which these individuals act and choose, may be influenced by their peers within the same higher education institution. Owens (2010) already noted that the educational environment may be representative to direct interaction between individuals in an educationally competitive environment, in which individuals may attempt to excel. The observed individuals are nested in geographical neighborhoods as well. Geographical neighborhoods capture the general circumstances of daily life and incorporate local labor market opportunities. It is of utmost importance to notice that the nesting structure in our data is imperfectly hierarchical, since newly qualified teachers are nested within higher education institutions and geographical neighborhoods, but the institutions and neighborhoods are not necessarily nested within each other. This data structure is conceptualized as a cross-classified data structure (Hox, 2010; Leckie, 2009; Snijders & Bosker, 2012), as depicted in Figure 5. Note that there are only two different levels in our data structure, but the higher level contains both higher education institutions and geographical neighborhoods. The higher levels are not linked by an arrow, since there is no nesting implied between these levels.

In the first model, the data on 31 961 individuals are cross-classified into 17 higher education institutions and 383 geographical neighborhoods (i.e. municipalities). For the second model, 3 163 individuals are nested in the cross-classification of 17 higher education institutions and 327 municipalities.

**Figure 5 Classification Diagram for the Cross-Classified Data Structure**



### 2.2.2 Multilevel Modeling

The most important advantage of using a multilevel model is the fact that we can distinguish several sources of (nested) variability in the model. Furthermore, it can be attempted to explain all distinct sources of variability by adding higher level-variables. If we would have neglected the multilevel structure and added the higher level variables as individual level covariates, which are often quantified as aggregate variables, we commit an ecological fallacy (Hox, 2010; Snijders & Bosker, 2012) and neglect ecological correlation (Robinson, 1950). This may lead to seriously biased results.

In order to explore whether the data reflect the conceptualized multilevel data structure or whether a less complex (and more parsimonious) data structure suffices, we adopt a model comparison and model selection approach based on unconditional models, often called 'null-models', 'empty models' or 'intercept-only models'. These unconditional models generate estimates of the amount of variability at each of the different levels. A set of four unconditional models will be assessed:

- a single level model, which does not take into account that some variation in the transition choices might be situated at either the higher education institution level and the geographical neighborhood level;
- an unconditional multilevel model, which includes only the higher education institution as a higher level;
- an unconditional multilevel model, which includes only geographical neighborhood as a higher level;
- a cross-classified unconditional multilevel model, which corresponds to the conceptualized data structure and, thus, includes both the higher education institution and the geographical neighborhood as higher levels.

The proportion of variability situated at each level can be computed by means of the variance partitioning coefficient (VPC), which is equal to the intraclass correlation coefficient (ICC) for two level variance component models. The ICC can equally good be interpreted as the correlation among units within the same group, ranging from 0, if the grouping provides no information, and 1, if all units within the same group are identical (Gelman & Hill, 2006). The ICC is defined as:  $ICC = \tau^2 / (\tau^2 + \sigma^2)$ , where  $\tau^2$  is the higher level variance (between group variation) and  $\sigma^2$  is the level-1 (error) variance (Hox, 2010; Snijders & Bosker, 2012). However, for logistic regression models, both for the multinomial case and the binomial case, the identification of the error variance is more complicated. Therefore, the variance of the standard logistic distribution, which equals  $\pi^2/3$ , will be used. This method implicitly uses a latent variable approach, where the error variance represents the underlying latent response

tendency. For the multinomial logistic regression model, C-1 intraclass correlation coefficients can be computed, which implicitly allows the group influences to vary across the nominal response categories (Hedeker, 2008). Intuitively, the ICC of all nominal response categories can be pooled to obtain a global ICC. In the estimation of the multinomial model, the higher level units are allowed to correlate across response categories ( $\tau_{012}$ ). However, the individual response categories at the lowest level (i.e. the level where the dependent variable has been defined) are assumed to be uncorrelated (i.e.  $\sigma_{12} = 0$ ), which corresponds to the Independence of Irrelevant Alternatives (IIA) assumption of the multinomial logit model. This assumption has been found to be, in general, reasonable enough when the response categories are distinct and dissimilar (Amemiya, 1981). It can be argued that the IIA-assumption may hold for our design, since the three response categories involve distinct and (on the short run) irreversible choice alternatives. The pooled ICC for full multinomial model can be computed as follows:

$$ICC = \frac{\tau_{01}^2 + \tau_{02}^2 + 2*\tau_{012}}{[(\tau_{01}^2 + \tau_{02}^2 + 2*\tau_{012}) + (\sigma_1^2 + \sigma_2^2 + 2*\sigma_{12})]} = \frac{\tau_{01}^2 + \tau_{02}^2 + 2*\tau_{012}}{[(\tau_{01}^2 + \tau_{02}^2 + 2*\tau_{012}) + (2*\pi^2/3)]} .$$

Most of the general statistical software is not yet able to efficiently combine both a cross-classified data structure with multinomial logistic regression techniques. Therefore, in this report, specific multilevel software MLwiN (version 2.28) will be used to analyze the data. This software provides an accessible graphical user interface, where many extensions (both conceptually and computationally) of the multilevel modeling approach have already been implemented. The most useful extensions for our setting are the cross-classification data structure and the different estimation procedures.

Traditional (quasi-) maximum likelihood techniques, such as marginal quasi-likelihood and penalized quasi-likelihood procedures, are implemented in MLwiN using an iterative estimation algorithm (i.e. (Restricted) Iterated Generalized Least Squares (Hox, 2010; Snijders & Bosker, 2012)). They are available for both first- or second-order Taylor expansions of the link function (Snijders & Bosker, 2012). A drawback of the application of traditional maximum likelihood techniques to multilevel logistic regression models is the observation that these techniques often leap into computational difficulties and numerical issues (e.g. convergence failure, negative variance estimates). Therefore a Bayesian model estimation procedure is to be preferred. The traditional techniques should only be used to generate starting values, to which the Bayesian estimation technique are believed to be robust (Leckie, 2009). The Bayesian parameter estimation technique uses a Markov Chain Monte Carlo (MCMC) estimation procedure, which generates estimates by updating the parameter estimates based on resampling parameter estimates from the conditional distributions. The Markov chains are created with a minimum of 5000 iterations, allowing a burn-in of at least 500 and a thinning factor of about 2 in order to stabilize the resulting sampling chains. The mixing of the MCMC sampling chains can be improved by applying some re-parameterization techniques, such as hierarchical centering and fixed effects orthogonalisation (Browne, 2015). These transformations are found to be more efficient compared to altering the length of the sampling chain, which will lead to a greater required computational effort. The application of MCMC techniques in multilevel models mitigates the drawback of inaccurate estimation of (variance) parameter, corresponding to relatively large standard errors, when there is a low number of higher level units. The mixing quality of the Markov Chain Monte Carlo sampling chains can be assessed by the effective sample size (ESS), which indicates the amount of information about the specific parameter (i.e. the number of independent samples obtained from the data).

To assess model fit and compare multiple competitive models, the Bayesian Deviance Information Criterion (DIC) can be used. The DIC is a generalization of the well-known Akaike Information Criterion (AIC) to models using MCMC-techniques. Information criteria use some criterion of goodness-of-fit, such as the deviance (i.e. -2 times the empirical log-likelihood value), but penalizes additional model complexity (Jen, Jones, & Johnston, 2009). The model complexity penalization corresponds to the effective number of parameters to be estimated in the model (Burnham & Anderson, 2002; Claeskens, 2012; Claeskens & Hjort, 2008). In practice, the DIC will be close to AIC, even though DIC originates from a Bayesian perspective (Claeskens & Hjort, 2008). The model with the lowest DIC is to be preferred.

Lastly, the statistical inference procedure on a multilevel model will be discussed. Statistical inference relies on hypothesis tests and evaluation of statistical significance levels, which in turn relies on the appropriateness of the testing procedure. In this report, the standard Wald Chi-squared test, which can be computed as a squared t-statistic (i.e.  $W = [\beta / \text{s.e.}(\beta)]^2 \sim \chi_{df}^2$ ), will be used. The Wald test is useful for testing fixed effects and covariance parameters. However, using (asymptotically) chi-squared distributed tests to evaluate the random part's variance parameters suffers from the drawback that, under the null hypothesis, the testing value is on the boundary of the parameter space (i.e. zero) since we do not envisage negative variances. Hox (2010) and Snijders and Bosker (2012) suggest dividing the resulting p-value by two, which corresponds to one-sided testing. We will comply with this suggestion when reporting significance of the variance components of the multilevel models. The statistical significance of the variance parameters can be cross-validated, in a Bayesian MCMC estimation setting, by looking at the generated confidence intervals

## 2.3 Variables

### 2.3.1 Outcome Variables

As noted above, the dependent variables in both models will be categorical variables. The first model examines the labor market entrance decision at the moment of graduation from teacher training, where the individual has the following three different decision options:

- *The individual starts (to look for) a job outside of teaching* [Elsewhere]. These individuals were not found in the teaching assignments database, nor in the higher education database. This implies that these individuals were (i) still unemployed and/or looking for work, (ii) employed outside of teaching or (iii) employed outside of Flanders. We cannot further refine this category yet<sup>5</sup>. Only 16.5% of the sample belongs to this category. This category will be used as a reference category in the analysis.
- *The individual continues studying in higher education* [Further Education]. This category contains all individuals who are still enrolled in higher education after graduation from teacher training. It should be highlighted, again, that newly qualified teachers who started teaching while still being enrolled in higher education were also classified in this category, assuming that further education in the official higher education system takes priority over its combination with the actual occupation (mostly because of the assumed time-intensivity of education). This category embodies 20.6% of the sample.
- *The individual starts a teaching career* [Teaching]. These individuals have acquired a teaching position within one year after graduation, considering regular calendar years rather than academic years. The rationale of this lag/delay of decision options was that looking for teaching positions after

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<sup>5</sup> Addition data requests are pending. The additional data will allow us to identify where teaching graduates are employed, if not in education.

graduation and being employed as a teacher may take some time. Even though, the one year period is chosen arbitrarily, it seems reasonable. This category embodies 62.8% of the sample.

The dependent variable of the first model is a multinomial, unordered categorical variable. The second model examines the labor market entrance decision at the moment the teaching graduate finishes higher education. Since this implies that we cannot and will not find the individual in the higher education database anymore, the middle decision option can be omitted. The dependent variable of the second model is, thus, a binomial (binary) variable.

## 2.3.2 Explanatory Variables<sup>6</sup>

### 2.3.2.1 Individual Level

The individual level predictors can be split into two categories; demographics and educational characteristics, which are related to the individual's performance and ability during his/her school career. Demographics, such as gender, age and nationality, have been used both as control variables and as substantial explanatory variables. These variables cannot be controlled by the individual. Nonetheless, they can be used to profile newly qualified teachers and examine differences with respect to the probability of starting a teaching career. Females are more attracted to starting a teaching career and, hence, more often become teachers (Ballou, 1996; Dolton, 1990; Guarino et al., 2006; Hanushek & Pace, 1995; Kılınç et al., 2012; King, 1993; Krumboltz et al., 1976; Leigh, 2012; Rots et al., 2013; Watt & Richardson, 2007), while the effects of age (measured in years) and nationality (comparing non-Belgian people to Belgian people) are inconclusive.

The educational characteristics consist of general academic ability and school career variables. Academic ability, which is closely related to teacher quality, has most often been found to have a negative effect on the probability of becoming a teacher (Guarino et al., 2006; Hanushek & Pace, 1995; Krumboltz et al., 1976; Pigge, 1985). However, Rots et al. (2013) reported a positive effect for Flemish teachers, suggesting that the best teaching graduates are more likely to actually become teachers, which confirms the results of Ballou (1996). In our empirical analyses, an ability measure was constructed based on the number of successful terminated higher education programs, compared to the number of higher education programs in which the individual enrolled. This measurement strategy contrasts with the commonly used grade point averages or performance scores. However, due to differences in credit intensity and troublesome allocation of exempted credits over different years and programs, the available credit information was biased/invalid and could not be used to construct informative predictors. Instead of academic ability, the used metric may provide information with respect to the relative amount of higher education attempts with respect to total number of enrollments it took before graduating from teacher education. Knowing that in the first model, newly graduated teachers are observed, this metric may be used as a crude proxy of the predetermination to enroll in teacher education.

With respect to the school career variables, we distinguish several phases of the school career. Firstly, we start with the educational form of secondary education. We distinguished five different categories: (i) General, teaching generic skills aimed at transition to higher education; (ii) Technical, which provides

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<sup>6</sup> An overview of the explanatory variables and some descriptive statistics are included in Appendix.

a mixture of general and technical subjects and skills aimed at either labor market entrance or transition to higher education; (iii) Vocational, which is practice-oriented and aimed at labor market entrance; (iv) Artistic, providing a mixture of general, artistic and practical education, aimed at either labor market entrance or transition to higher education; and (v) others, containing both unknown values due to secondary education outside of Belgium and specific method schools (e.g. Steiner, Freinet, Montessori). This last category will be used as reference category. We expect that this variable has an overall effect on the career decision making process, since the labor market entrance profiles of the students are somewhat different. Vocational students have been educated in a practice-oriented way, while the general secondary education students were expected to continue higher education and utilize their intellectual capabilities.

Secondly, some school career variables with respect to the teacher training are expected to be important, such as the type of teacher training and the level of education the degree gives access to. With respect to the type of teacher training, we distinguish (i) professional bachelor degrees, which are used as reference category; (ii) specialized teachers, which are advanced bachelor degrees and (iii) subject-specific teacher training. Rots and Aelterman (2008) included a crude dummy variable distinguishing between professional and academic teaching degrees and found the academic degrees to be more likely to become teachers. Ballou (1996) comments on special education training, which is provided as an advanced bachelor degree, to have a high positive effect on the probability of becoming a teacher. These graduates already obtained a teaching degree<sup>7</sup>, but immediately started the advanced bachelor to specialize their teaching skills, which implies that these teaching graduates were already determined to start a teaching career.

Ballou (1996) and Rots et al. (2007) included a more detailed measure of teaching education, distinguishing between teaching degrees granting access to nursery, primary and secondary education teaching, finding a negative effect on the probability of starting a teaching career. This negative effect can be attributed to the rationale that higher levels of education implicitly increases higher/more alternative labor market opportunities, which in turn decreases the relative attractiveness of the teaching career (Rots et al., 2007). This variable is included by adding the ISCED level (see UNESCO Institute for Statistics (2012)) to which the teaching degree grants access as a teacher. The ISCED level covariate is categorized as (0) nursery education, (1) primary education, (2) lower secondary education, (3) higher secondary education, and (4) special needs education<sup>8</sup>.

Following Dolton (1990) and Watt and Richardson (2007), we include the subject specialty of the highest degree. Due to a large number of different subjects in higher education, we used the following categories: (i) undefined subjects, possibly degrees obtained outside of Belgium (used as the reference category), (ii) Education, (iii) Arts, Languages and History, (iv) Social Sciences, (v) Natural Sciences, (vi) Engineering, (vii) Agriculture and Veterinary, and (viii) Medicine and Health Care. In the first model, which is the transition decision after graduation from teacher training, this variable indicates the subject specialty of the subject-specific teacher training (Ballou, 1996; Rots et al., 2013; Rots et al., 2010), since these individuals obtained a non-teaching master degree prior to starting teacher training. In the second model, which examines the transition decision after final graduation from higher

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<sup>7</sup> Newly qualified teachers were observed at the moment of graduation from teacher training. However, if the initial teacher training was immediately followed by another teaching degree (e.g. the advanced bachelor), graduation from the latter teacher training was taken into consideration.

<sup>8</sup> It should be noted that the last category (4) is not an official part of the ISCED-classification. The coding is due to a parsimonious reclassification of the relevant existing ISCED-levels.

education, this variable indicates the subject-specialty of the highest degree obtained in higher education, irrespective of its timing. If the highest degree is obtained before starting teacher training, this might indicate individuals who consider teaching as a fallback career option. Alternatively, if the highest degree is obtained after graduation from teacher training, this might mean that the graduate discovered (possibly during teacher training) that teaching is not the job he/she aspires and chose to continue non-teaching education. Alternatively, the reorientation serves to expand subject-knowledge, which will probably lead to enhanced labor market opportunities in the teaching profession as well. The expected effect is congruent to the debate on relative attractiveness of the teaching profession compared to a cornucopia of alternative career opportunities.

In order to mitigate the ambiguity of the previous variable, we include a study break variable in the model. This variable is categorical and distinguishes: (i) no/small study breaks, indicating no break or a one-year break within the same degree, (ii) fallback career option, indicating a longer break where the individual studied a non-teaching subject prior to the break and started teacher training after the break, (iii) specialized teacher, indicating a longer break where the individual had teacher training prior to the break and started a different type of teacher training after the break, and (iv) reorientation, indicating a longer break where the individual followed teacher training prior to the break but continued higher education away from the teaching subject after the break. The duration of the study break has been separately quantified.

### 2.3.2.2 Family Level

Research on educational progress by Rasbash et al. (2010) distinguishes between family, school and area effects, finding that a large amount of variation is situated at this family level. In our conceptual framework, we seem to have missed the family level, even though several researchers have included family characteristics in their empirical analysis (e.g. Ballou (1996), Dolton (1990), King (1993), Rots et al. (2013), van de Werfhorst, de Graaf and Kraaykamp (2001) and Watt and Richardson (2007)). The omission of these characteristics in our model is solely due to data unavailability<sup>9</sup>. We cannot (yet) distinguish siblings from the dataset, however, since the time frame is not very long, we do not expect there to be many siblings (or other family members) in the dataset. Therefore, up to now, family level covariates will be included as individual level covariates.

The only family variable in our data, is an indicator on whether the individual student has received a study grant during higher education. In Belgium the eligibility criteria for applying and receiving a study grant are linked to the family income. Hence, this variable indicates (indirectly) the amount of financial support the student receives from his/her family and, therefore, serves as a proxy to the family's financial status (Nguyen & Taylor, 2003).

### 2.3.2.3 Higher Education Institution Level

The inclusion of higher education institution level, hereafter (for simplicity and brevity) called the institution level, covariates is scarce in labor market transition research. The institution level characteristics consist of two groups of variables; factual institution characteristics, which are very institution-specific, and composition variables, which aggregate personal and/or family characteristics of the institution's student-body.

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<sup>9</sup> Additional data requests on family characteristics are pending.

Institution-specific characteristics have not been providing consistent results (Dolton, 1990; Guarino et al., 2006; Leigh, 2012). Nonetheless, we include the higher education association of which the specific institution is a member, the school type and the school size. There are five higher education associations in Flanders; Ghent, Antwerp, Limburg, Leuven and Brussels. Each of these associations are built around a university, which regulates and supports the whole association. The school type variable is an indicator that distinguishes between university colleges (used as the reference category) and universities. The two former variables might serve as a proxy to the institution's perceived status, since universities are given a lot of media attention and are often perceived as prestigious institutions of higher education, from which the associated university colleges benefit as well. The school size variable has been operationalized as the average (over time) of the number of teaching students at the higher education association<sup>10</sup>. We don't use the full number of students at the higher education association, since we believe that using the size of the whole institution's student body goes beyond the concept of the relevant reference group (i.e. the 'frog-pond in Hox' (2010) metaphor) of teaching graduates.

The student-body composition variables were derived from the same rationale as the school size variable, meaning that we compute the composition variables using the teaching students at the higher education association level, rather than the whole institution's student body. We used the student-body composition variables as identified by Guarino et al. (2006); gender composition, expressed as the proportion of male teaching students, nationality composition, expressed as the proportion of non-Belgian teaching students, socio-economic status composition, expressed as the proportion of teaching students who received a study grant during their educational career, and average academic ability, computed using our crude measure of general academic ability.

#### 2.3.2.4 Geographical Neighborhood Level

The characteristics of the geographical neighborhood consist of demographic characteristics, specifying location and urbanity of the neighborhood, and the socio-economic composition of the population, focusing on education, occupation and income (Guarino et al., 2006; Krumboltz et al., 1976; Leigh, 2012; Rots et al., 2013). The demographic variables consist of the region variable, which specifies whether the individual lives (i) outside of Belgium, (ii) in Flanders, and (iii) in Brussels or Wallonia. This variable originally specified all Belgian provinces, but during empirical model fitting the aggregated variable fitted better. The urbanity concept was captured using the morphological part of the Halleux-index (Halleux, Derwael, & Merenne-Schoumaker, 1998), which is defined at the municipality level. The socio-economic composition variables, incorporating information on the population's educational, occupational and income levels, are not easily available. Therefore, we use the functional part of the Halleux-typology, which already clustered the municipalities based on this information. Since the Halleux-typology may be outdated, the more recent Dexia-typology (Dessoy, Erauw, & Rombouts, 2007) may be used as a substitute to the Halleux-typology.

In order to control for local labor market opportunities, we include the number of schools, irrespective of the schools being nursery, primary or secondary education schools, within a thirty kilometer radius from the individual's place of residence. This threshold agrees with the findings of Sandow and Westin (2010) on acceptable commuter traffic.

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<sup>10</sup> The aggregation at the higher education institution level has been 'super-aggregated' at the level of the higher education association to which the higher education institution belongs, in order to avoid small and uninformative cell counts.

## Chapter 3. Newly Qualified Teachers' Decisions

### 3.1 Unconditional Models

The results of the four alternative unconditional models can be found in Table 1. Firstly, it should be noted that the two last models, respectively the geographical neighborhood model and the cross-classified model, still suffered from instability of the Markov chains after quintupling the chain length and application of both hierarchical centering and orthogonal parameterization transformations. This instability may harm the reliability of the parameter estimates. Secondly, the reported standard errors of the parameter estimates for all models accounting for the higher education institution level seem to be quite large, which can be primarily attributed to the small number of groups (i.e. all 31 961 individuals are nested in only 17 higher education institutions). This drawback, however, is mitigated by the use of MCMC estimation techniques.

Judging the poor performance of the single level model, resulting in the highest DIC in the model set, neglecting the multilevel data structure would almost certainly lead to substantial bias of the results. Taking the geographical neighborhood into account, the DIC already decreases substantially, which means that the fit improves. The category-specific ICC values show that respectively 2.2% and 2.5% of the variability in relative choices can be attributed to differences between geographical neighborhoods. The pooled ICC shows that the geographical neighborhood incorporates (only) 3.9% of total variability in the model. The multilevel setting where only the higher education institution is incorporated in the data modeling framework performs much better than the single level and the geographical neighborhood level models, showing a decrease in DIC of more than 1 000. The estimated intraclass correlation coefficients, which are interpretable as variance partitioning coefficients, show that 13.8% and 13.5% of the respective equation's variability is situated at the higher education institution level. The pooled ICC shows that about 23.3% of the variability in the model is due to differences between higher education institutions, which can be considered as a substantial amount. Lastly, the cross-classified model, which corresponds most closely to our conceptualized data structure, seems to stretch the multilevel data complexity too far. The DIC value is well above the higher education institution level model, but remains lower than the geographical neighborhood level model. This cross-classified model attributes 23.1% of the variability in the model to the higher education institution, which is comparable to the former, more parsimonious model, and 5% to the geographical neighborhood level, which is higher than its more parsimonious equivalent. Nonetheless, the DIC values suggest that the more parsimonious model, only incorporating the higher education institution level into the data modeling procedure, should be preferred. In the remainder of this chapter we will elaborate on this higher education institution model. Since there is no geographical neighborhood level variation to be explained, the geographical neighborhood level covariates will be included as individual level covariates to control for their potential impact on the transition decision.

**Table 1 Unconditional Model of the Newly Qualified Teachers' Decision**

	Single Level Model		Multilevel: Higher Education Institution		Multilevel: Geographical Neighborhood		Multilevel Cross-Classification	
	Equation 1	Equation 2	Equation 1	Equation 2	Equation 1	Equation 2	Equation 1	Equation 2
	$\frac{\pi_{Teaching}}{\pi_{Elsewhere}}$	$\frac{\pi_{Further Educ}}{\pi_{Elsewhere}}$	$\frac{\pi_{Teaching}}{\pi_{Elsewhere}}$	$\frac{\pi_{Further Educ}}{\pi_{Elsewhere}}$	$\frac{\pi_{Teaching}}{\pi_{Elsewhere}}$	$\frac{\pi_{Further Educ}}{\pi_{Elsewhere}}$	$\frac{\pi_{Teaching}}{\pi_{Elsewhere}}$	$\frac{\pi_{Further Educ}}{\pi_{Elsewhere}}$
<b>PARAMETER ESTIMATES</b>								
<b>FIXED</b>								
Intercept	1.335 (0.015)***	0.222 (0.018)***	1.190 (0.178)***	0.009 (0.178)	1.390 (0.024)***	0.276 (0.027)***	1.274 (0.181)***	0.087 (0.180)
<b>RANDOM</b>								
<i>Higher Education Institution</i>								
Intercept Variance			0.527 (0.226)***	0.513 (0.232)**			0.525 (0.222)**	0.507 (0.226)**
Covariance			0.480 (0.218)**				0.475 (0.211)**	
<i>Geographical Neighborhood</i>								
Intercept Variance					0.074 (0.012)***	0.083 (0.015)***	0.081 (0.020)***	0.113 (0.025)***
Covariance					0.055 (0.011)***		0.076 (0.020)***	
<b>INTRACLASS CORRELATION COEFFICIENTS</b>								
ICC_HighEduInst			13.8%	13.5%			13.8%	13.4%
			23.3% (Pooled)				23.1% (Pooled)	
ICC_GeoNbh					2.2%	2.5%	2.4%	3.3%
					3.9% (Pooled)		5.0% (Pooled)	
<b>MODEL DIAGNOSTICS</b>								
N_Individuals	31961		31961		31961		31961	
N_HighEduInst	-		17		-		17	
N_GeoNbh	-		-		383		383	
Deviance	58 496.83		56 952.75		57 897.76		56 839.88	
DIC	58 498.82		56 984.61		58 144.26		57 217.64	

Wald-test statistical significance [ $\chi^2_{(df=1)}$ ]: \*: p < 0.10 ; \*\*: p < 0.05 ; \*\*\*: p < 0.01

## 3.2 Conditional Models

### 3.2.1 Model Estimation

After having identified the most appropriate model structure to analyze the data, the variability at the higher education institution level may be explained by both individual level and higher education institution level covariates. The final model has been built from the unconditional model onwards, gradually adding groups of variables to more complex models. From the full model, the insignificant variables were removed. At each step of the modeling procedure, the model fit as well as the stability and sensitivity of the remaining parameter estimates were assessed. The final model, reported in Table 2, is the most stable model, has an acceptable complexity and fits the data quite well.

The reported model is the most parsimonious model, which means that insignificant variables were removed from the model if and only if they did not acceptably improve the model fit, did not harm stable estimation and did not influence the magnitude of the other parameters. This model's DIC substantially decreased ( $\Delta\text{DIC} = 3\,167.51$  with respect to the unconditional model) to 53 817.10, which is the lowest DIC we have found while fitting several alternative models. The ESS-values show a rather good stability of the MCMC sampling chains. Almost all ESS values are well above 1 000. Only a few ESS-values are below 1 000, however the posterior distribution of these parameters look quite stable (i.e. approximately normal) and simultaneous assessment of the confidence intervals does not lead to ambiguous interpretation of the estimated parameters.

### 3.2.2 Interpretation

There is still some unexplained variation between higher education institutions left, which cannot be explained by the included predictor variables. This remaining variation, however, is not large in magnitude. The pooled ICC shows that only 2.0% of total variation in the decision variance is left, which is primarily caused by remaining variation for the model's second equation (i.e. the decision between the pursuing further education and starting (to look for) a non-teaching career).

#### 3.2.2.1 Individual Level

The demographic variables are significant predictors for the probability of starting a teaching career and continuing further education, both compared to the probability of starting (to look for) an occupation outside of teaching. Our findings are mostly in line with the existing scientific literature. Firstly, the feminization of the teaching profession seems to persist, since male teaching graduates are most likely to look for a career outside of teaching after graduation. This effect can be explained using the results of King (1993) saying that males give higher importance to salary, prestige, security and career advancement opportunities, which are not instantaneously identified with the teaching profession (Shipp, 1999). Secondly, newly qualified teachers with a non-Belgian nationality, which corresponds to belonging to a minority group, will be less likely to start teaching. There is no direct evidence found that the nationality diversity in the teaching profession is rising, which contrasts with the claims of Guarino et al. (2006). The minority group-graduates are not likely to continue further education either. Thirdly, older teaching graduates are more likely to start a teaching career, however the magnitude of this parameter is limited. Older graduates are substantially less likely to pursue further education after obtaining a (teaching) degree. These effects indicate that older, and possibly

**Table 2 Multilevel Multinomial Logit Model of the Newly Qualified Teachers' Decision**

	Teaching / Elsewhere		Further Education / Elsewhere		Markov Chain Control
	Coef. (β)	Exp(β)	Coef. (β)	Exp(β)	ESS
<b>FIXED</b>					
Intercept	-0.258 (0.266)	0.773	6.732 (0.456) ***	838.82 3	6700 - 5500
<b>Individual Characteristics</b>					
<b>Demographics</b>					
Gender (1 = Male)	-0.418 (0.037) ***	0.658	-0.327 (0.045) ***	0.721	5250
Nationality (1 = Non-Belgian)	-1.098 (0.144) ***	0.334	-0.568 (0.202) ***	0.567	8100 - 7200
Age	0.039 (0.006) ***	1.040	-0.245 (0.013) ***	0.783	7200 4200
<b>Educational Career, Performance and Ability</b>					
Academic Ability	0.083 (0.098)	1.087	-1.021 (0.110) ***	0.360	3400
Educational Form SO (other = ref.)					
General Secondary Education	0.764 (0.055) ***	2.147	0.358 (0.074) ***	1.430	7000 - 6300
Technical Secondary Education	0.722 (0.063) ***	2.059	-0.072 (0.082)	0.931	5800
Vocational Secondary Education	1.203 (0.136) ***	3.330	0.038 (0.168)	1.039	3700
Artistic Secondary Education	0.303 (0.108) ***	1.354	-0.229 (0.136)	0.795	6000
Type of Teacher Education (Professional = ref.)					
Specialized Teaching	0.180 (0.102) *	1.197	-0.209 (0.158)	0.811	6800
Subject-Specific Teaching	-0.872 (0.116) ***	0.418	-0.258 (0.180)	0.773	5700 - 3900
Subject of Highest Diploma (other = ref.)					
Education	//////// no obs. //////////		//////// no obs. //////////		
Arts, Languages and History	0.113 (0.094)	1.120	-0.601 (0.128) ***	0.548	6700
Social Sciences	-1.108 (0.093) ***	0.330	-1.514 (0.129) ***	0.220	7100
Sciences	-0.601 (0.133) ***	0.548	-0.319 (0.158) **	0.727	6900
Engineering	-1.214 (0.297) ***	0.297	-2.350 (0.580) ***	0.095	9500 - 8800
Agriculture and Veterinary	-0.870 (0.648)	0.419	0.052 (0.699)	1.053	6600 - 6300
Medicine and Health Care	-0.906 (0.100) ***	0.404	-1.583 (0.144) ***	0.205	7200
<b>Family Support</b>					
Financial Support (1 = Grant)	0.095 (0.044) **	1.100	0.159 (0.051) ***	1.172	4200
<b>Higher Education Institution Characteristics</b>					
<b>Higher Education Institution Specific Characteristics</b>					
School Type (1 = University)	0.117 (0.100)	1.124	0.189 (0.157)	1.208	4200
<b>Student Body Characteristics</b>					
Gender Proportion (Male)	-0.046 (0.011) ***	0.955	-0.048 (0.025) **	0.953	960 - 170
Nationality Prop. (Non Belgian)	0.060 (0.034) *	1.062	0.017 (0.077)	1.017	1300 - 300
Average Academic Ability	-0.011 (0.020)	0.989	-0.044 (0.048)	0.957	840 - 150
<b>Geographical Neighborhood</b>					
Region (Not In Belgium = ref.)					
Flanders	0.524 (0.148) ***	1.689	0.322 (0.276)	1.380	8100 - 6100
Brussels & Wallonia	-0.178 (0.187)	0.837	-0.335 (0.317)	0.715	7900 - 6800
<b>RANDOM</b>					
Intercept Variance	0.015 (0.009) **		0.117 (0.071) **		2400 - 900
Covariance between Equations	0.001 (0.020)				1000
<b>MODEL DIAGNOSTICS</b>					
N_Individuals	31 961		<b>Deviance</b>		53 748.86
N_HighEdInst	17		<b>DIC</b>		53 817.10

Wald-test statistical significance  $[\chi^2_{(df=1)}]$ : \* : p < 0.10 ; \*\* : p < 0.05 ; \*\*\* : p < 0.01

more mature, teaching graduates are more attracted to finding a job instead of continuing to study. In finding a job, there is a moderate preference to start teaching rather than aspire alternative career opportunities. This effect may as well be seen as an indication that the older graduates started to start teaching education at a later moment in their life cycle with a certain predeterminedness/intention to start a teaching career.

General academic ability, measured as the number of successfully terminated educational tracks compared to the number of tracks started, can easily discern the '(initially) aimless students' from the determined students. If a student reorients his/her study choice, this variable will be negatively affected. It should be noted that 'reorientation' is not an indicator of a 'waterfall effect' in (higher) education, since reorientation does not necessarily mean to aim at less ambitious, easier or more vocationally oriented educational tracks, which are certainly no synonyms either. Taking this definition into account, it seems that aimlessness does not significantly affect the decision to start a teaching career (once again compared to looking for a job outside of teaching). However, it evidently negatively affects the probability of pursuing further education. This result suggests that, whenever the 'aimless students' find their focus, they will terminate higher education after graduation and will start looking for a (teaching) job.

The educational form in secondary education has a statistically significant impact on the probability of starting to teach. Students following the regular Flemish educational system (i.e. excluding method schools and non-Belgian secondary education) are all more likely to start a teaching career after graduation. It seems astonishing that the effect of vocational students is highest, however this can be explained by the preference of vocational students for enrolling in a (professional) nursery teaching program (Smet & Janssens, 2013). Students from general secondary education are more likely to pursue further (higher) education, which makes sense because general secondary education is aimed at continuation in higher education.

With respect to the level of teacher education, only the type of teacher education has been found to significantly influence the probability of starting a teaching career, without significant impact on the probability of pursuing further education, relative to the probability of starting (to look for) a job outside of teaching. Having obtained a specialized teaching degree, which corresponds primarily to advanced bachelor programs aimed at teaching various types of 'special needs'-students, increases the probability of actually starting a teaching career. This reinforces the results of Ballou (1996) even though the effect is now only borderline significant. The effect of graduating from subject-specific teacher training on the relative probability of starting a teaching career is substantially negative, which agrees with the results of Ballou (1996) and Rots et al. (2007).

In order to refine the finding that higher degrees induce more attractive career opportunities and, thus, decrease the probability of starting a teaching career, the subject of the highest (non-teaching) degree has been included in the model. The reference category of this variable are education and unclassifiable (complex and/or amalgamated) subjects. Almost all subjects have a negative effect on the probability of starting a teaching career, compared to looking for a job outside of teaching. Grossly congruent effects can be seen with respect to the relative probability of pursuing further education. Teacher who have obtained a degree in arts, languages or history will most likely not pursue higher education but start (to look for) an occupation, where they show no significant preference for teaching or non-teaching positions. Students with a degree in social sciences, natural sciences, engineering and medicine and health care are most likely to start looking for a job, preferring non-teaching positions.

For these subjects, the alternative career opportunities will probably be more attractive than the teaching career. Students with a degree in agriculture and veterinary show no statistically significant difference to the reference group. It can be argued, though, that these subjects are probably less fit for, or at least not directly aimed at, teaching positions either.

The ISCED level, specifying to which educational levels the teaching degree grants access, has been found to have an insignificant impact on the decision process and was therefore omitted from the final model without significant impact on the parameter stability and/or the sampling chain mixing. Both study break variables, type and duration, were insignificant as well, which is why both variables were likewise omitted. The insignificance of the study break type indicates that the timing of obtaining any other non-teaching, subject-specific degrees has barely any predictive importance in the model.

### 3.2.2.2 Family Level

The financial support variables can be regarded as a proxy to the family's financial status. Individuals having obtained a study grant during higher education are more likely to start a teaching career compared to looking for a job outside of teaching. The effect on the probability of pursuing further education is positive as well, which is in contrast to the findings of Dolton (1990), who found that socioeconomic status has a negative effect. Nevertheless, the positive effect might be explained using the intergenerational resemblance motive (van de Werfhorst et al., 2001), where individuals strive to be(come) 'at least as good as their parents', which can be interpreted as a high motivation to improve the financial and social comfortability in their lives.

### 3.2.2.3 Higher Education Institution Level

No statistically significant and important effects were found for either the higher education association or the school size. The parameter estimates showed to be robust to exclusion of these variables from the model. The effect of school type, operationalized as an indicator distinguishing university colleges from universities, did not show significant effects, which is comparable to the results of Dolton (1990) and Guarino et al. (2006). However, the exclusion of this variable induced some parameter instability, which shows that it is necessary to at least control for this higher education institution characteristic.

Even though no results were reported, Guarino et al. (2006) identified several composition variables. The student body characteristics which resulted in a stable and interpretable model were gender proportion, nationality proportion and average academic ability. The inclusion of the socioeconomic status composition variable caused the estimation procedure to leap into convergence issues and instable parameter estimates, which forced us to omit the variable from the final model. The gender proportion, expressing the proportion of males in the higher education institution where the individual obtained a teaching degree, negatively influenced the probability of starting to teach compared to looking for a non-teaching job. A similar effect has been found for the probability of pursuing further higher education. This composition variable provides some evidence for the importance of the 'competitive peer group' of the individual. Males were shown to be less probable to both start teaching and pursue higher education, both compared to starting (to look for) occupations outside of teaching. Being among people with higher career aspirations, while trying to complete the same studies, may boost the individual's career aspirations as well, resulting in a higher probability of looking for non-teaching occupations. This effect might be argued to be conditional on having more or less the same academic abilities than your peers. However, the average academic ability does not show any

significant results, which provides some evidence against this consideration. The nationality proportion, showing the proportion of non-Belgian fellow students in the same higher education institution, only has a borderline significant, but positive effect on the relative probability of starting to teach. This aligns with the findings and suggestions of Matheus et al. (2004) whose results show that newly qualified teachers are very tolerant towards a multicultural society and even have a higher motivation to ‘multiculturalise’ the current society.

#### 3.2.2.4 Geographical Neighborhood Level

The only statistically significant geographical neighborhood characteristic is the region variable, specifying the region where the individual’s place of residence is located. This operationalization resulted from pooling the Belgian provinces, which showed to empirically outperform the (over)detailed province measure. Nonetheless, a common construct remains valid under this pooled operationalization; Flanders is Dutch-speaking, while the common tongue in Wallonia and Brussels is primarily French, indicating some language barriers. Because the scope of this study was restricted to teaching positions in Flanders, it should not be curious that the effect of Flanders on the probability of starting to teach is positive, while the other effects are not significantly different from zero. Flemish people are, thus, more likely to start teaching in Flanders, while Walloons and people from Brussels may experience both distance-related and language-related (i.e. communication and culture) barriers towards teaching in Flanders.

All other geographical neighborhood characteristics, such as the urbanity indices and the socioeconomic climate indices, showed no statistically significant predictive importance in the initial labor market transition decisions after graduation from teacher training. The parameter estimates were insensitive to inclusion and/or exclusion of the characteristics in the final model. This could be expected, since it was already shown that the variability located at the geographical neighborhood level was very low.

The inclusion of the local labor market opportunity indicator, operationalized as the number of schools (i.e. a mixture of nursery, primary and secondary schools) within a thirty kilometer radius from the individual’s place of residence, did not show any statistically significant effect. This can be interpreted as the insensitivity of people to the number of labor market opportunities in their ‘neighborhood’, even though the geographical neighborhood (i.e. municipality of the place of residence) is not equal to the labor market opportunities neighborhood. This may indicate that newly qualified teachers are somewhat ‘footloose’ (i.e. spatially unrestricted) with respect to finding and working in a teaching position, which means that they are willing to commute farther than the acceptable thirty kilometer distance each workday. Even though this unrestrictedness can be judged to be a source of generosity and flexibility in the labor market, it may in time become a burden, rather than an act of generosity, which may lead to distress, demotivation and attrition from the teaching profession as well.



## Chapter 4. Final Graduates' Decisions

### 4.1 Unconditional Models

Once again, four unconditional models are fitted on the data in order to select the most appropriate data structure (see Table 3). The data contains 3 163 individuals, which are separately nested in the 17 higher education institution and 327 geographical neighborhoods (i.e. municipalities). Note that the number of higher education institutions are equal to the previous dataset of newly qualified teachers, while the number of geographical neighborhoods is lower than the number in the previous dataset. This is due to the current dataset being a subset of the larger dataset, identifying teaching graduates at the end of their higher education tracks. The model instability, encountered when fitting the large dataset, does not occur for this smaller dataset, which facilitates parameter estimation using MCMC procedures and allows valid and more robust interpretation of the results. The relatively large standard errors for the variance parameter of the higher education institution level persistently remains. This tendency is still attributed to the small number of groups at the higher education institution level.

The single level model results in the highest DIC value in the model set, which indicates that neglecting the multilevel data structure would (again) lead to substantial bias of the results. The incorporation of the geographical neighborhood as a higher level barely decreases the DIC value. Only 1.8% of total variation can be attributed to the geographical neighborhood differences. The estimated variance parameter is only borderline significant, which indicates that this variance partition is close to negligible. When incorporating only the higher education institution level into the data structure, the DIC value decreases substantially ( $\Delta\text{DIC} = 326.84$ ). The estimated intraclass correlation coefficient is 22.6%, which is comparable to the results of the newly qualified teachers' multinomial model. When incorporating both models simultaneously into the complex data structure, leading to the cross-classified multilevel model, the DIC barely decreases. The variance partitioning shows that 22.3% of the variability is located at the higher education institution level and 0.8% of the variability can be attributed to the geographical neighborhood. The estimated variance parameter for the geographical neighborhood is not significantly different from zero. Because of these negligible differences between the higher education institution multilevel model and the multilevel cross-classification model, we will opt for the most parsimonious model, which requires a substantially lower computational effort during estimation. Therefore, only the higher education institution level will be incorporated as a higher level in the analyses, while the geographical neighborhood characteristics will be incorporated as individual level predictors to control for their potential impact on the transition decision. This framework becomes very comparable and equivalent to the previous model on the transition decision of the newly qualified teachers.

**Table 3 Unconditional Model of the Final Graduates' Decision**

	Single Level Model	Multilevel: Higher Education Institution	Multilevel: Geographical Neighborhood	Multilevel Cross-Classification
<b>PARAMETER ESTIMATES</b>				
<b>FIXED</b>				
Intercept	0.956 (0.041)***	0.827 (0.252)***	0.992 (0.045)***	0.851 (0.190)**
<b>RANDOM</b>				
<i>Higher Education Institution</i>				
Intercept		0.963 (0.417)**		0.956 (0.412)**
Variance				
<i>Geographical Neighbourhood</i>				
Intercept			0.061 (0.046)*	0.036 (0.040)
Variance				
<b>INTRACLASS CORRELATION COEFFICIENTS</b>				
ICC_HighEduInst		22.6%		22.3%
ICC_GeoNbh			1.8%	0.8%
<b>MODEL DIAGNOSTICS</b>				
N_Individuals	3 163	3 163	3 163	3 163
N_HighEduInst	-	17	-	17
N_GeoNbh	-	-	327	327
Deviance	3 733.73	3 392.59	3 700.21	3 374.92
DIC	3 734.78	3 407.94	3 731.62	3 407.40

Wald-test statistical significance [ $\chi^2_{(df=1)}$ ]: \* :  $p < 0.10$  ; \*\* :  $p < 0.05$  ; \*\*\* :  $p < 0.01$

## 4.2 Conditional Models

### 4.2.1 Model Estimation

The modeling strategy is completely equivalent to the previous estimation procedure (i.e. the newly qualified teachers' transition model), which means that the final model selection will occur using a stepwise augmentation of the unconditional model. At each step of the modeling procedure, the model fit as well as the stability of the estimation technique and the sensitivity of the remaining parameter estimates will be assessed. The final model, reported in Table 4, is the most stable model, has an acceptable complexity and fits the data quite well.

The reported model is the most parsimonious model. All insignificant variables were omitted from the model, if and only if they didn't harm the stability of the estimation procedure and didn't influence the magnitude of the other parameters (i.e. sensitivity considerations). The model's DIC value decreased substantially with respect to the unconditional model ( $\Delta DIC = 498.12$ ) resulting in a DIC of 2909.82, which is the lowest DIC found within the model space taken into consideration. The effective sample sizes (ESS), which are used to assess the corresponding number of independent samples in the full MCMC sampling chain, are mostly (a lot) larger than 10 000, which enhances accuracy and stability of the estimates and improves their interpretability. The ESS-value of the estimated intercept variance is 6 740, which is still quite satisfactory but nonetheless lower than 10 000. The generated posterior parameter distributions look very stable and approximately normal, which is to be expected using

more than 5 000 independent ‘sampling observations’. Simultaneous assessment of the generated confidence intervals didn’t lead to ambiguous interpretation of the parameter estimates.

**Table 4 Multilevel Multinomial Logit Model of the Final Graduates’ Decision**

	Teaching / Elsewhere		Markov Chain Control
	Coef.(β)	Exp(β)	ESS
<b>FIXED</b>			
Intercept	0.409 (0.454)	1.505	18 585
<b>Individual Characteristics</b>			
<i>Demographics</i>			
Gender (1 = Male)	-0.789 (0.107) ***	0.454	18 256
Age	-0.255 (0.031) ***	0.775	18 018
<i>School Career, Performance and Ability</i>			
Academic Ability	1.200 (0.217) ***	3.320	18 874
Educational Form SO (other = ref.)			
General Secondary Education	-1.134 (0.188) ***	0.322	19 271
Technical Secondary Education	-1.105 (0.215) ***	0.331	18 898
Vocational Secondary Education	0.371 (0.706)	1.449	17 478
Artistic Secondary Education	-0.570 (0.400)	0.566	18 925
Subject of Highest Diploma (other = ref.)			
Education	1.886 (0.418) ***	6.593	19 039
Arts, Languages and History	0.741 (0.431) *	2.098	18 839
Social Sciences	-0.138 (0.438)	0.871	19 014
Applied Sciences	-0.990 (0.511) **	0.372	18 650
Medicine and Health Care	0.454 (0.471)	1.575	19 414
Break (none/small = ref.)			
Fallback Career	-0.177 (0.400)	0.838	19 259
Specialized Teacher	0.689 (0.364) **	1.992	18 397
Reorientation	-0.638 (0.630)	0.528	19 286
Break Duration	-0.408 (0.154) ***	0.665	18 628
<i>Family Support</i>			
Financial Support (0/1)	-0.251 (0.123) **	0.778	20 019
<b>Higher Education Institution Characteristics</b>			
<i>Student Body Characteristics</i>			
Gender Proportion (Male)	-3.569 (1.620) **	0.028	11 250
<b>Geographical Neighbourhood</b>			
Region (Out of Belgium = ref.)			
Flanders	0.503 (0.136) ***	1.654	15 800
Brussels & Wallonia	-0.793 (0.386) **	0.452	19 066
<b>RANDOM</b>			
Intercept Variance	0.039 (0.039)		6740
<b>MODEL DIAGNOSTICS</b>			
N_Individuals	3 163	Deviance	2882.91
N_HighEduInst	17	DIC	2909.82

Wald-test statistical significance [ $\chi^2_{(df=1)}$ ]: \* : p < 0.10 ; \*\* : p < 0.05 ; \*\*\* : p < 0.01

## 4.2.2 Interpretation

The intercept variance of the final model has decreased drastically compared to the unconditional model. The ICC shows that barely 1.2% of the total variation is left unexplained by the model. The estimated intercept variance is not significantly different from zero, which indicates that the final model is able to explain almost all variability at the higher education institution level. However, excluding the negligible intercept variance from the model, which corresponds to fitting a single level version of the full model<sup>11</sup>, has shown to fit less well than the multilevel model. This indicates that incorporation of the multilevel data structure in the modeling framework remains important, even when intercept variances are explained by the model.

### 4.2.2.1 Individual Level

From the pool of the demographical variables, only gender and age were significant predictors of the relative probability of starting a teaching career in comparison with starting (to look for) a career outside of teaching. Firstly, the nationality of the final graduates did not show to have a significant impact and could be removed from the model without harming the stability of the estimation procedure or affecting the magnitude of the remaining parameters. The coefficient of nationality shows a positive effect, which might contribute to a certain extent to the observation of Guarino et al. (2006) that the proportion of non-white teachers is rising. However, because of the underrepresentation of non-white teaching graduates in Flanders (only 0.8% of the current dataset consists of non-Belgian people), this claim/observation should not be regarded over-optimistically. Secondly, the persistence of the feminization trend in education is evident. Male graduates are still less likely to start a teaching career than to exploit alternative career opportunities. Thirdly, the age of the teaching graduates has a significantly negative impact on the relative probability of starting a teaching career, which is quite different than the results of the previous model. Further investigation of the sample descriptives (see Appendix) showed that the minimum age still lies around 20, but the maximum age became lower. The most mature teaching graduates, thus, are believed to already have entered the teaching profession. The youngest graduates remained in higher education (or returned to higher education after a while), which does not directly imply that they obtained another diploma. Nonetheless, we believe that the negative effect, with respect to the current sample, indicates that the youngest graduates attempted to continue education and thereby delayed their labor market entrance, while the older graduates were already resolute about working somewhere else (i.e. not as a teacher).

General academic ability has a strongly positive effect on the probability of starting a teaching career. This directly contradicts critiques on the diminishing quality or academic ability of the current inflow of teachers (Huyge et al., 2009). The least 'aimless students' are more likely to become teachers. Note that in the previous model, the newly qualified teachers were indifferent between teaching careers and their alternatives, but were less likely to pursue further education. Therefore, the most determined and most able students could already be on the labor market after graduation from teacher training. The average academic ability of the current dataset was indeed significantly lower than the average academic ability of the previous dataset (Mean Difference = 0.050; Welch's  $T = 12.78$ ;  $df = 3645$ ;  $p < 0.001$ ), even though the magnitude of the difference is very small. The most able

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<sup>11</sup> The results of this specification test are not reported.

graduates, from those who continued or returned to higher education, are more likely to start a teaching career, which still suggests that beginning teachers are not part of the least able students.

The educational form in secondary education has a statistically significant effect on the probability of starting a teaching career, however the results are different from those of the previous model. The final graduates who were in general or technical secondary education are least likely to start a teaching career. This may be due to the fact that they pursued further higher education (to which especially the general secondary education students were more inclined), which paved the way to more attractive career opportunities. Graduates from artistic secondary education show less extreme, though similar results, even though the parameter estimate is not statistically significant. Vocational students are still more likely to start a teaching career, even though this effect is not statistically significant either. It is observed that these graduates stuck to professional bachelor degrees in education or nursing, which are unlikely to pave the road to more academic, high-profile occupations in comparison to their former degrees.

The level of teacher education has not been found to be a significant predictor of the probability of starting a teaching career at the moment of final graduation from higher education. This variable could be omitted without negative consequences to both the estimation procedure and the parameter stability. Closely related to this variable is the ISCED level variable, which has not been found to have a statistically significant effect either. The subject-specialty of the highest degree obtained in higher education has a statistically significant effect. The final graduates who obtained their highest degree in an education-related subject are, obviously, most likely to start a teaching career. Subject-specialists in arts, languages and history now have a higher probability of starting a teaching career. Final graduates who obtained their highest degree in applied sciences, which is a pooled category, consisting of natural sciences and engineering, are least likely to start a teaching career, why the social sciences and medicine and health care are not statistically significant (whereas they had a negative effect in the previous model).

The study break variables are much more relevant in this model compared to their insignificant impact in the previous model. The final graduates may have 'interrupted' their scholarly career attempting to find a satisfactory occupation or have just taken a study break. The type of study break shows that teaching graduates who took 'specialization breaks' are more likely to start a teaching career. These graduates studied (and graduated from) educational tracks before and after their break, which indicates a sincere desire to become a teacher. The fallback career breaks and reorientation breaks do not significantly differ from the reference category, which is none or only a one year break. Nonetheless, the parameter estimates are negative, which indicates that they are slightly less likely to start a teaching career. Fallback careerists may be seen as graduates who obtained their teaching degree to 'keep their options open', while 'reoriented teachers' deliberately decided to pursue non-teaching degrees after their break with the intention to pursue non-teaching careers as well. The study break duration has a significantly negative effect on the probability of starting a teaching career. The longer the study break lasts, the less likely final graduates will be to start teaching. A logical explanation may be that the 'study breaks' are in fact periods of time in which teaching graduates (or 'not-yet-graduates' at all) are looking for an occupation. If this frictionless unemployment lasts longer, labor market entrants will probably start to explore occupational (and possibly necessary educational) alternatives. These alternatives will most likely be(come) more attractive than the teaching occupation, which will decrease the probability of starting to teach.

#### 4.2.2.2 Family Level

The financial support variable, operationalized as an indicator variable to whether or not the final graduate has ever received a study grant, can be used as a proxy to the family's financial status. This variable had a moderate, but significantly positive effect on the probability of starting a teaching career compared to start (looking for) non-teaching careers, and had a larger positive effect on the relative probability of pursuing further education. Newly qualified teachers, thus, preferred to pursue further education. After finishing higher education, the effect of this variable becomes significantly negative. A possible explanation for this effect could be that at the moment when all investments have been made and the best foundations to be (come) 'at least as good as their parents' (van de Werfhorst et al., 2001) have been formed, by means of finishing higher education, more lucrative and financially attractive career opportunities surpass the attractiveness of the teaching career. These lucrative career options provide higher chances on improving the financial and social life-standard of the graduates' parents.

#### 4.2.2.3 Higher Education Institution Level

In accordance with the previous model, no statistically significant effects could be found with respect to the higher education institution-specific characteristics. All covariates, including higher education association, school type and school size, could be excluded from the model without negatively affecting parameter stability and estimation feasibility.

Most of the student-body characteristics proved to be insignificant as well. These variables, such as nationality and socioeconomic proportions and the average academic ability, were omitted from the model without harming the model's stability. The only student-body characteristic which showed a statistically significant effect was the gender composition. The gender composition is still operationalized as the proportion of male students in teacher education. This variable could not validly be updated to the last higher education track followed by the final graduate, due to data unavailability. Nonetheless, this variable is still interpretable as lagged effects of the gender proportion during teacher education. The effect of gender proportion on the probability of starting a teaching career is significantly negative. This might indicate that the 'seed of aspiration' for more prestigious and rewarding careers which are planted during teacher training, has substantial effects on the long run (i.e. the moment of definitively finishing higher education). After finishing further education, these final graduates are less likely to start teaching.

#### 4.2.2.4 Geographical Neighborhood Level

The only statistically significant geographical neighborhood characteristic is the region variable, which is a demographic characteristic specifying the region where the individual's place of residence is located. Once again, the operationalization fitted the data better when pooling all Flemish provinces in one category and pooling all Walloon provinces and the Brussels capital province in the other category. The parameter interpretation of the variable almost remains the same as in the previous model. Living in Flanders positively influences the probability of starting a teaching career (which is restricted to teaching positions in Flanders). The effect of living in Wallonia or Brussels became significantly negative, suggesting that the language and/or culture barriers towards teaching in Flanders become somewhat more insurmountable.

All other geographical neighborhood characteristics, including urbanity and socioeconomic indices of the Belgian municipalities (i.e. Halleux-index and Dexia-index), did not show any significant effects. These variables were omitted from the final model without disturbing stable parameter estimation or biasing other parameter estimates.

The local labor market opportunity covariate had no statistically significant effect on the probability of becoming a teacher. The final graduates who become teachers are, thus, characterized by a certain degree of 'footlooseness' or unrestricted willingness to commute farther than the acceptable thirty kilometer distance to reach their workplace.



## Chapter 5. Discussion & conclusions

“Teaching is the one profession that creates all others”

– Unknown

“Teaching is not a lost art, but the regard for it is a lost tradition”

– Jacques Barzun

Based on the quotes above, we can start to fully understand the actual scope of education and teachers in our society. Teachers are primordial to our current knowledge-oriented ‘Learning Economy’, since they distribute knowledge to the new generations. This knowledge serves as the foundation of the economy itself and the development of new knowledge. Hence, the role and position of teachers in our Belgian economy should receive proper attention and the regard for the teaching profession should be (at least) restored to its high-esteem position.

During the last decades, the teaching profession has somewhat lost its high regard. As the society’s expectations of schools and education rise, the teaching profession becomes more important but encompasses more responsibilities and tasks. Up to now, the educational system still struggles to efficiently assign the additional requirements. Teachers were found relatively unprepared, causing them to feel over-burdened and demotivated, which in turn affected their performance. The teaching profession is characterized as a flat career track with limited task- and functional differentiation, limited growth opportunities, high workload, high administrative requirements and high uncertainty during the early stages of teaching. The juridisation of the teaching profession, encompassing juridical procedures to address complaints towards teachers for insufficient student performance, is leaving teachers to feel continuous pressure towards justification of their classroom actions and resulting student performance, even when causes may be external to the teaching influence. The prejudice and long-term view on teaching employment may demotivate newly qualified teacher to enter the teaching profession.

Gradually, the teaching labor market is coming under pressure. The recruitment of high-school graduates into teaching education is said to become more heterogeneous and prospective teachers lack the right teacher profile (i.e. with respect to mindset and motivations). The job entrance of teaching graduates into the actual teaching profession is scanty. Ample attrition, due to early attrition of young teachers and steady retirement of the aging/greying teachers, further complicate the critical challenge of providing qualitative education for future generations.

Many psychological process/state theories have already been developed and elaborated. Such theories serve their goal in explaining teachers’ entrance into the teaching profession quite well. However, these theories lack a priori predictive power and are less suited to give direction to policy enhancement. The development of a predictive model serves as a profiling instrument, answering the question on who starts a teaching career nowadays, and a detection instrument on where improvements on the throughflow of (newly) qualified teachers into the teaching profession can be made. Formally, the focus of this research has been the inflow of teaching graduates into the teaching profession, attempting to provide a satisfactory answer to the research question: “Can the newly

qualified teachers' entrance into the teaching profession in Flanders be predicted and/or explained based on factual characteristics of the individual in its environment?"

Framing the individuals in their environment requires a multilevel analytical framework. Individuals are nested (separately/independently) in higher education institutions, which serve as collegial but competitive environments in which graduates attempt to excel, and geographical neighborhoods, describing the daily life environment. Each of these environments may influence the personal setting in which labor market entrance decisions are made. Neglecting the environmental setting of decision-making may lead to attribution bias. The consideration set of decision options may be influenced by the environment(s) in the sense that environmental characteristics define boundaries to the perceived feasibility and attractiveness of some decision options (e.g. graduates living in poor socio-economic situations may not perceive management positions as feasible/attainable occupations, while high socio-economic families may not content themselves with their offspring pursuing low prestige jobs).

Next to the environmental influences on the decision-making process, the existing literature finds the decision-making process of first labor market entry to be related to education attainment, as a preparation process towards labor market entry and development of the relevant consideration set of professional opportunities. Thus, the analysis was designed as a sequence of decisions, which resulted in two separate models: a newly qualified teachers' model and a final graduates' model. The most important results of these models are summarized and discussed below.

## 5.1 Newly Qualified Teachers' Decisions

The first model analyzes the labor market entrance decision of newly qualified teachers observed at the time of graduation from teacher training. The individuals are confronted with a choice between three distinct decision options: the option to start a teaching career within one year after graduation, the option to pursue further (higher) education, and the option to start (looking for) any non-teaching employment opportunity. Within the multilevel environment of the newly qualified teacher, the geographical neighborhood does not seem to coerce a statistically significant impact on the decision process. The higher education institution accounts for a considerable amount of variability in the decision process, suggesting that collegial and competitive environments in higher education influence the subsequent labor market entrance decision. The variability cannot be entirely explained by the final model, meaning that there are alternative, non-observed characteristics of higher education institutions involved in the decision process.

The final model indicates that the actual inflow of newly qualified teachers into the teaching profession are primarily Belgian, female, more mature newly qualified teachers living in Flanders, who have made a predetermined choice to enroll in teaching education. The entrants' educational careers started primarily in vocational and/or technical secondary education, followed by enrollment higher education teacher training in professional bachelor and/or advanced bachelor programs. The newly qualified teachers who started in general secondary education were more likely to continue higher education after obtaining a teaching diploma. Of the subject-specific newly qualified teachers, those who have a subject-specialty in arts, languages or history are most likely to start teaching, while the subject-specialists in social sciences, natural sciences and biomedical sciences (i.e. medicine and health care) are least likely to start teaching. The most plausible cause for this observation has been identified as the availability of more attractive/lucrative labor market opportunities.

Newly qualified teachers who obtained a study grant during tertiary education, which might be indicative for low socio-economic status of the graduate's family, are recognized as hard and realistic workers. The intergenerational resemblance/mobility claim of van de Werfhorst et al. (2001) stating that the offspring aspires to attain a status that is regarded at least as good as their parents' seems to be supported. In particular, this results in realistic behavior which seems to reflect the idiom "put your money where your mouth is", by which we mean that either the newly qualified teacher valorizes/exploits his/her educational investment and starts a teaching career or the graduate aspires even more/deeper occupational and educational opportunities and continues further higher education.

The composition of the teaching student-body of the higher education institution where the teaching degree has been obtained, mixed institutions (with respect to both gender and nationality) influence the labor market entrance decision. Being among male teaching students has a negative impact, since male students are more oriented towards prestigious and rewarding careers than female students. The male students might 'radiate' their career preferences, hereby influencing their peers' decision away from the option to start teaching. Being among peer teaching students of mixed nationalities, the probability of starting a teaching career increases. Research tends to find that teachers are more tolerant towards multiculturalism and being taught (how to teach) in a multicultural environment might induce a certain desire to 'multiculturalise' the new generations in society. Regarding the observed discrepancy with respect to the individual's own nationality, primarily the 'native' teaching students seem to be influenced by the multiculturalism of peer teaching students.

The number of local (teaching) labor market opportunities does, surprisingly, not seem to have an effect. This lacking effect might suggest that starting teachers may be somewhat footloose, which means that they are willing to commute more than thirty kilometers to find a teaching position. This is perceived as a double-edged sword since this generosity/flexibility may become a burden after a while, leading to higher attrition.

## 5.2 Final Graduates' Decisions

The second model tracks those newly qualified teachers who opted to pursue further education and those who started looking for non-teaching jobs but re-enrolled in higher education after a while, until the end of higher education. At this moment, the final graduates are confronted with a dichotomous decision; starting a teaching career or start (looking for) a non-teaching occupation. In accordance with the previous model, the geographical neighborhood does not coerce a statistically significant impact on the decision process. The higher education institution accounts for a comparable amount of variability in the model, which strengthens our assessment of the variance partitioning. However, the higher education institution level variability can be adequately explained by the final model.

The inflow of final graduates into the teaching profession can be profiled as young women living in Flanders, which were determined to teach and/or academically able. This profile is almost exactly equivalent to the profile of the previous model, suggesting the inflow profile is relatively stable/persistent over time. The scholarly career of the final graduates who start teaching careers is equivalent as well. It is unlikely that they graduated from general and technical secondary education. The vocational education graduates are most likely to enter the teaching profession, once again primarily as nursery education teachers. Their continued higher education was observed to be

restricted to additional profession bachelor degrees, which are unlikely to pave the road towards more academic, high prestige professional opportunities. Only the highest diploma obtained in higher education has significant predictive importance in the model, which may be due to the fact that all final graduates already obtained a teaching diploma (cf. in the previous model). The final graduates with a subject-specialty in education-related topics are most likely to start teaching, while subject-specialists in applied sciences (i.e. natural sciences or engineering) are least likely to start teaching careers.

The most important contribution of this model to the previous one consists of the found impact of study breaks during higher education. Teaching graduates who enhance their teaching skills (by means of alternative education-related subject programs) are more likely to start teaching, which is obviously due to strong (pre-)determination to start teaching. Fallback career graduates (who started teacher training after the break) or reorientation graduates (who turned away from teaching education after the break) are less likely to start a teaching career, even though the found effects were not statistically significant. The duration of the study break showed to be important as well. Longer lasting study breaks have a strong negative impact on the probability of starting a teaching career after finishing higher education. It can be argued that it might be important to find a teaching position rather quickly after graduation, which is a 'demand-side' challenge of teaching labor market. If study breaks last too long, for example while trying to find suitable employment as a newly qualified teacher, individuals will try to exploit alternatives and will probably not search for teaching positions any longer. This might suggest a quick demotivation in teaching. The need to make a living might transcend the motivation to start teaching as a calling (although further research might be needed to affirm this claim).

The labour market entrance decision of those students who obtained a study grant during tertiary education, once again interpreted as an indication for low socio-economic status of the family, took a whole other direction in comparison to the previous model. The effect turned significantly negative. Thinking a little further, this turnaround might not even be insensibly unexpected. After being recognized as hard workers who start a teaching career to exploit their recently obtained qualification or pursue higher education to broaden their attainable horizon, better occupational alternatives might be within reach of the final graduate. Since the alternative (and possibly more rewarding) occupational opportunity may result in a more appreciable pay-off from the additional educational investment, the final graduate will turn away from pursuing a teaching career. In the light of the intergenerational resemblance theory of van de Werfhorst et al. (2001) intergenerational mobility is confirmed as the final graduate surpasses the socio-economic position of his/her parents.

The effect of the student-body composition at the higher education institution, which is still defined at the teacher training program, can be interpreted as a lagged effect. Only the gender composition has a statistically significant effect. The effect of being among male fellow teaching students during teacher training, still negatively affects the probability of starting a teaching career after finishing higher education. The negative effect may even have become stronger. This may suggest that the 'seed of higher occupational aspirations' planted during teacher education still grows flowers after finishing higher education.

The effect of the number of local (teaching) labor market opportunities remains the same as in the previous model, being insignificant. The suggested motivation also applies for this model, being an indifference of footlooseness to find a possible teaching position after graduation.

## 5.3 Policy Recommendations

Firstly, the design of the educational administration data warehousing created, linked, maintained and provided by the Flemish Ministry of Education may need to be revised and/or augmented. The augmentation could consist of the integration of the Flemish department, the Walloon department and the Federal department. Eventually the data warehouse could integrate multiple European countries, since the knowledge-orientation is of prime importance across nations. Additional maintenance of the data warehouse and validation of its completeness and correctness should be safeguarded at all times. In this way, the population coverage of relevant individuals in the data warehouse can be optimized, which will provide more generalizable results of research. This recommendation is especially relevant with respect to the adult educational tracks into the teacher education and, subsequently, inflow into the teaching profession.

Secondly, a returning issue in this report has been the regression of societal status and regard of the teaching profession. An obvious remedy is to provide the teaching profession with new suit of attractiveness. Based on our results, an attempt is made to specify some relevant issues/headlines to aim this general and unspecific recommendation.

The feminization of the teaching profession has been found to be persistent. Women are found to prefer the aspects that are more closely aligned with the teaching profession. The existing scientific literature suggests that women are somewhat more inclined to choose the teaching profession out of intrinsic and altruistic motivations (e.g. desire to teach, wanting to work with children, make a significant contribution to society, etc.), while men are more focused on extrinsic motivators, such as prestige, rewards and growth opportunities. The question rises if restoration of the gender balance in the teaching profession is desirable. It is possible that gender balance is valued from a societal point-of-view, however, this should not have any detrimental influence on the teaching profession aspects itself, nor should it forcefully balancing the gender proportions lead to the creation of an under-motivated and underachieving teacher population. The evidence presented in this report shows that the gender composition in the teaching profession negatively influences the probability of starting a teacher career as the proportion of males during teacher training grows larger. From this point of view, striving to balance the gender composition in teacher education is detrimental to the provision of enough adequately trained teachers. Thus, if a gender balance in the teaching profession is deemed important and needs to be restored, the teaching profession has to change its societal image first. The profession needs to improve its competitiveness on the labor market. If teaching is perceived as a rewarding occupation and the prestige in society of teachers is restored, men will be more attracted to the teaching profession and simultaneously the negative impact of a masculinization of the teaching graduates will disappear.

The ethnic diversity of the teaching force is considered to be enriching to the education of the young generations in society. They will be brought up with the necessary mindset to take their place in a multicultural society. Additionally, the teachers with a minority ethnic background might have an exemplary role for other young minority group members with respect to proper and prosperous educational and/or occupational aspirations. This beneficial process seems to be already incorporated in the labor market entrance decision process, as graduates from a multicultural scholarly environment during teacher education are more likely to actually start a teacher career. Even though the benefits of a multicultural teaching force are attractive and abundant, this policy goal seems rather hard to accomplish. The main barriers to entrance into the teaching labor market are often based on language,

communication and culture. The academically and professionally proficient teaching graduates should be encouraged to pursue a teaching career, regardless of their ethnic background. However, they may be required to assume a neutral position with respect to religion and culture and should be able to communicate proficiently in multilinguistic environments.

The results show that, especially in the decision process of newly qualified teachers at the moment of graduation from teacher education, age is a significant predictor of the probability to start a teaching career. More mature teachers, whom are believed to have chosen to enroll in teacher education based on well-grounded and possibly motivational reasons, are more likely to start a teaching career. It is very likely that these mature graduates already have experience outside of the teaching area. This implies that a lot of expertise from outside basic educational settings is brought into the teaching profession and teaching practice. This sideways inflow into the teaching profession is valuable and should be welcomed warmly into the teaching profession. Hence, further steps should be taken to improve the attractiveness of the teaching profession to more mature experts from outside of the teaching area. It is possible that these efforts simultaneously prove to be prosperous with respect to the earlier defined goal to improve the image of the teaching profession as well.

Even though there are some differences with respect to secondary education backgrounds, no distinction should be made when addressing teaching students to become teachers. High school graduates from general and technical secondary education are more inclined to pursue further education, which provides more attractive career opportunities than the teaching career, while vocational graduates were found to pursue teaching careers in nursery education. When attracting teaching graduates with general and technical secondary education backgrounds, a focus on the subject-specific teaching graduates may be needed. This teaching degree should be more clearly positioned in the teaching labor market. The teaching profession needs to be able to compete with the alternative career options faced by these teaching graduates.

Based on our results, those who choose the teaching profession are not the least academically able students. An indicator for the number of followed and successfully terminated higher educational tracks compared to the number of started higher educational tracks shows that after some years of aimlessness, in which many different tracks were followed, graduates will find a focus. After graduation from the 'focus track', they will enter the labor market, where they are indifferent between teaching and non-teaching careers. The modest policy recommendation can be made to aid quick reorientation of aimless students, most favorable towards the teaching profession. These students might at first not realize the potential of the teaching profession. Increasing the awareness of the potential of the teaching profession, once again, is mostly equivalent to increasing the profession's relative attractiveness on the labor market.

In order to secure the quality of the educational system, one should pay sufficient attention to the diversity of the teaching force's subject specialties. Based on our model, courses such as languages, arts and history will likely not be undersupplied, but teachers of natural sciences and mathematics are expected to become scarce. The recommendation is congruent to the previous recommendation; positioning the teaching profession as an attractive occupation, which can compete with and compare to occupational alternatives. This will attract a portion of the graduates now facing more attractive career opportunities into the teaching career, simultaneously providing a satisfying supply of teachers for these scientific subjects and improving the image of the teaching profession.

Lastly, we would like to make a remark on the fallback career option, which is too often seen as a problematic track to enter the teaching profession. This option is depicted as a career option to which an individual ‘defaults’. However, this image could be totally wrong. We argue, intuitively, that the fallback career option may be (an important) part of the sideways-inflow into the teaching profession. People with a non-teaching expertise may become teachers after having pursued other occupations or when the labor market environment is tense. This may be considered as attracting non-teaching expertise in the teaching profession, which is not necessarily bad. The only untouchable requirement to become a qualified teacher consists of having obtained a teaching degree. If labor market entrants having obtained a teaching degree, they should be considered proficient to teaching our young generations and, thus, should neither be displayed as inferior teachers.

In summary, we argue that improving the competitive positioning of the teaching profession in the labor market, by displaying it as more rewarding in terms of social and financial rewards, restoring the prestige of teachers in society by highlighting their role in the knowledge-oriented economy, making it a challenging job without falling into the trap of pillarising and overloading with administration, will invoke a giant leap into the right direction. Men will be more inclined to choose for the teaching occupation, which might in turn strengthen the rewarding image of the profession. Minority groups will be attracted to the teaching occupation. The profession can compete with alternative career options, which will secure the supply of high quality, subject-proficient and motivated teachers.

## 5.4 Limitations & Further Research

A first limitation of this report is the omission of the family level. We are not yet able to identify the family to which each individual belongs. We do not suspect that there are many siblings in the dataset, so the bias of the results is expected to be minor to negligible. However, the main drawback of this omission lies in the unavailability of relevant family level characteristics, such as family situation, family size, family income, ethnicity of parents, parental education and parental occupation. The omission of these variables might cause some omitted variable bias, leading to underestimation or overestimation of the included variables. The necessary data requests and privacy protection processes are in progress. These characteristics will be included in future research.

A second limitation consists of the operationalization of some variables. Due to erroneous credit accumulation data, we used a proxy for academic ability based on the number of successfully completed programs compared to the number of started programs. This operationalization, however, focuses more on the aimlessness of early educational transition decisions in higher education, rather than quantifying academic ability. A second variable is the nationality. A more qualitative operationalization of the individual’s ethnic background consists of the ethnicity indicator (based on the nationality of the individual, parents and grandparents) rather than using the current nationality of the individual. The second operationalization issue will be resolved when obtaining the requested data (cf. supra).

A third limitation is the issue of data incompleteness. There were incomplete observations for several variables when the individual studied outside of Belgium, which forces us to include the individuals in a reference category. This practice may cause some unobserved heterogeneity in the reference category. Some of this intercept heterogeneity can be captured by the estimation of the random intercept, as we did. However, it would be better to link databases on a cross-national level to obtain

better results. There are several 'Learning Economies' in the world, so the importance of education is far from an isolated, single-country matter. In addition to this limitation, the adult education data suffered from even more severe incompleteness and contained several errors. The respective databases should be reviewed and the data collection and validation could be handled with more care. This would enrich our datasets, since we now miss an entire branch of possible inflow into the teaching profession.

A fourth limitation is the lagged teaching decision. We chose to quantify the teaching category as those individuals who obtained a teaching position/ assignment within one year after graduation. It did not matter how long this teaching assignment lasted (it could be only for a few days with an interim contract). However, we argued that even when a teaching assignment has been obtained, the individual had to deliberately look for teaching assignments. Thus, we can validly assume that the individual was determined to start a teaching career. Nonetheless, we miss intermediate entrance into the teaching profession (i.e. less than 1 572 individuals) by fixing the time frame of the decision models to moment of graduation +1. Future research may want to include a dynamic dimension to the choice models.

Last but not least, we do not know where the individuals who do not start a teaching career are going. How long do they need to look for alternative occupations (i.e. frictionless unemployment)? Which professions are they practicing? Where are they employed? In which sector? In which function? Etc. These questions would be equally interesting to frame some labor market competitiveness issues of the teaching profession. The additional data requests might facilitate the answers on these questions as well.

## Appendices



# Appendix I: Explanatory Variables

## B1.1 Overview of the Explanatory Variables

NAME	TYPE	DESCRIPTION
<b>Individual</b>		
<i>Demographics</i>		
Gender	Binary	Gender (0 = female; 1 = male)
Nationality	Binary	Nationality (0 = Belgian; 1 = Non-Belgian)
Age	Continuous	Age in years, measured at the time of graduation
<i>School Career/Performance/Ability</i>		
Academic Ability	Continuous	Ability measure (%) based on the number of successfully terminated programs in which the individual enrolled
Educational Form (secondary education)	Categorical	Educational Form in Secondary Education (1 = General; 2 = Technical; 3 = Vocational; 4 = Artistic; 5 = other)
Study Break Type	Categorical	Type of break during educational career (0 = None/Small; 2 = Fallback Career Option; 3 = Specialized Teacher; 4 = Reorientation)
Study Break Duration	Continuous	Duration of the Study Break (in years)
Type of Teaching Diploma	Categorical	Type of Teaching Diploma (1 = Professional; 2 = Academic (omitted); 3 = Specialization; 4 = Doctoral (omitted); 5 = (Subject Specific) Education)
ISCED level	Categorical	ISCED level teaching access with the current teaching diploma (0 = Nursery; 1 = Primary; 2 = Lower Secondary; 3 = Higher Secondary; 4 = Special Needs)
Subject-specialty of Highest Diploma	Categorical	Subject-specialty of the diploma (0 = undefined; 1 = Education; 2 = Arts, Languages and History; 3 = Social Sciences; 4 = Natural Sciences; 5 = Engineering; 6 = Agriculture and Veterinary; 7 = Medicine & Health Care)
<i>Parental Support</i>		
Financial Support	Binary	Indicator whether or not the individual has received a study grant during education (0 = No; 1 = Yes)

NAME	TYPE	DESCRIPTION
<b>Higher Education Institution</b>		
<i>Higher Education Institution Specific Characteristics</i>		
Higher Education Association	Categorical	Overarching academic association of which the higher education institution is a member (1 = Ghent Association; 2 = Antwerp Association; 3 = Limburg Association; 4 = Leuven Association; 5 = Brussels Association)
University	Binary	Indicator of the institution being a university college (professional) or a university (0 = college; 1 = university)
School Size	Continuous	Average (over time) of the number of teaching students at the academic association
<i>Student-body Composition</i>		
Gender Composition	Continuous	Proportion of male teaching students at the academic association
Nationality Composition	Continuous	Proportion of non-Belgian teaching students at the academic association
Socio-Economic Composition	Continuous	Proportion of teaching students, who got a study grant during their career, at the academic association
Average Academic Ability	Continuous	Average Academic Ability
<b>Geographical Neighborhood</b>		
<i>Demographic</i>		
Region	Categorical	Region of the place of residence (0 = Not in Belgium; 1 = Flanders; 2 = Brussels and Wallonia)
Morphologic Halleux-typology	Categorical	Halleux-classification on urbanity of the municipality (0 = Not in Belgium; 1 = Rural; 2 = Weak; 3 = Moderate ; 4 = Strong; 5 = Central Agglomeration)
<i>Population Composition</i>		
Functional Halleux-typology	Categorical	Halleux-classification of the municipality based on education, occupation and income (0 = Not in Belgium; 1 = Rural; 2 = Weak; 3 = Moderate ; 4 = Strong; 5 = Central Agglomeration)
Dexia-typology	Categorical	Dexia-classification of municipalities based on socio-economic profiles (0 = Not in Belgium; 1 = Residential; 2 = Strongly Urbanized; 3 = Rural; 4 = Concentrated Economy; 5 = Central; 6 = Tourist; 7 = Semi-Urbanized)
<i>Local Labor Market Opportunities</i>		
Teaching Job Opportunity	Continuous	Number of schools within a thirty kilometer radius from place of residence

## B1.2 Descriptive Statistics of the Explanatory Variables<sup>12</sup>

### B1.2.1 Model 1: Newly Qualified Teachers

VARIABLE		TEACHING N = 20 084	FURTHER EDUCATION N = 6 597	ELSEWHERE N = 5 280	TOTAL N = 31 961
<b>Individual</b>					
<i>Demographics</i>					
Gender	Male	58.6%	20.1%	21.2%	
		13.5%	4.6%	4.9%	23.1%
Female		64.1%	20.8%	15.1%	
		49.3%	16.0%	11.6%	76.9%
Nationality	Belgian	63.1%	20.7%	16.2%	
		62.5%	20.5%	16.1%	99.0%
Non-Belgian		38.1%	16.8%	45.2%	
		0.4%	0.2%	0.4%	1.0%
Age	Mean	23.52	22.39	24.24	23.41
	Min	20	19	20	19
	Max	58	52	58	58
<i>School Career/Performance/Ability</i>					
Academic Ability	Mean	0.9246	0.8870	0.9285	0.9175
	Min	0.25	0.25	0.25	0.25
	Max	1.00	1.00	1.00	1.00
Educational Form	Other	58.6%	11.1%	30.4%	
		9.0%	1.7%	4.7%	15.3%
	General	59.0%	25.5%	15.5%	
		28.3%	12.2%	7.4%	48.0%
	Technical	69.2%	18.8%	11.9%	
		21.6%	5.9%	3.7%	31.2%
Vocational		81.0%	11.4%	7.6%	
		2.4%	0.3%	0.2%	3.0%
Artistic		58.6%	19.7%	18.5%	
		9.0%	0.5%	0.5%	2.5%
Study Break Type	None/Small	63.3%	21.7%	15.0%	
		56.5%	19.4%	13.4%	89.4%
	Fallback Career	48.8%	9.7%	41.4%	
		1.3%	0.3%	1.1%	2.7%
	Specialization	62.5%	12.0%	25.5%	
	4.5%	0.9%	1.8%	7.2%	
Reorientation		66.7%	17.1%	16.3%	
		0.5%	0.1%	0.1%	0.8%

<sup>12</sup> The upper left halve of each cell contains the proportions with respect to the row content. The bottom right halve contains the proportion with respect to the total sample size.

Study Break Duration	Mean	0.19	0.11	0.37	0.21
	Min	0	0	0	0
	Max	7	6	7	7
Type of Teaching Diploma	Professional	66.4%	22.4%	11.3%	
		50.0%	16.9%	8.5%	75.4%
	Specialization	74.7%	7.6%	17.8%	
		2.7%	0.3%	0.6%	3.6%
	Subject-Specific	48.2%	16.7%	35.1%	
		10.1%	3.5%	7.4%	21.0%
ISCED	Nursery	73.9%	19.7%	6.4%	
		12.7%	3.4%	1.1%	17.2%
	Primary	71.3%	21.3%	7.5%	
		17.0%	5.1%	1.8%	23.9%
	Lower Sec	59.1%	24.4%	16.4%	
	20.3%	8.4%	5.6%	34.3%	
	Higher Sec	48.2%	16.7%	35.1%	
		10.1%	3.5%	7.4%	21.0%
	General Support	74.7%	7.6%	17.8%	
		2.7%	0.3%	0.6%	3.6%
Subject-specialty of Highest Diploma	Other/Education	66.2%	21.7%	12.1%	
		53.2%	17.5%	9.7%	80.3%
	Arts, Languages and History	58.7%	17.4%	23.9%	
		4.7%	1.4%	1.9%	8.0%
	Social Sciences	38.1%	14.0%	47.9%	
		2.3%	0.9%	2.9%	6.1%
	Natural Sciences	38.7%	28.8%	32.5%	
		0.6%	0.5%	0.5%	1.6%
Engineering	40.4%	7.0%	52.6%		
	0.1%	0.0%	0.1%	0.2%	
Agriculture and Veterinary	37.5%	31.3%	31.3%		
	0.0%	0.0%	0.0%	0.1%	
Medicine and Health Care	52.3%	11.9%	35.8%		
	2.0%	0.4%	1.3%	3.8%	
<i>Parental Support</i>					
Financial Support	None	62.1%	20.5%	17.4%	
		49.2%	16.2%	13.8%	79.2%
	Study Grant	65.5%	21.2%	13.3%	
		13.6%	4.4%	2.8%	20.8%

VARIABLE		TEACHING	FURTHER EDUCATION	ELSEWHERE	TOTAL
<b>Higher Education Institution</b>					
<i>Higher Education Institution Specific Characteristics</i>					
Higher Education Association	Ghent Association	61.4%	20.0%	18.6%	
		14.6%	4.7%	4.4%	23.7%
	Antwerp Association	65.9%	19.2%	14.9%	
		9.3%	2.7%	2.1%	14.1%
	Limburg Association	63.4%	17.2%	19.4%	
	1.9%	0.5%	0.6%	3.0%	
	Leuven Association	63.0%	21.8%	15.2%	
		35.1%	12.1%	8.5%	55.7%
	Brussels Association	57.4%	15.5%	27.2%	
		2.0%	0.5%	0.9%	3.5%
University	College	66.2%	21.3%	12.5%	
		54.5%	17.6%	10.3%	82.3%
	University	47.4%	17.3%	35.3%	
		8.4%	3.1%	6.2%	17.7%
School Size	Mean	1158.72	1234.89	1106.89	1165.88
	Min	13	13	13	13
	Max	1926	1926	1926	1926
<i>Student-Body Composition</i>					
Gender Composition	Mean	24.14	24.38	25.35	24.39
	Min	18.30	18.30	18.30	18.30
	Max	35.62	35.62	35.62	35.62
Nationality Composition	Mean	0.91	0.91	1.03	0.93
	Min	0.25	0.25	0.25	0.25
	Max	6.21	6.21	6.21	6.21
Socioeconomic Composition	Mean	22.73	22.22	20.23	22.21
	Min	4.12	4.12	4.12	4.12
	Max	34.84	34.84	34.84	34.84
Average Academic Ability	Mean	91.17	91.00	91.42	91.18
	Min	86.19	86.19	86.19	86.19
	Max	97.42	97.42	97.42	97.42
<b>Geographical Neighborhood</b>					
<i>Demographic</i>					
Region	Not in Belgium	56.4%	7.1%	36.5%	
		0.6%	0.1%	0.4%	1.1%
	Flanders	63.1%	20.8%	16.1%	
		61.6%	20.4%	15.7%	97.6%
	Brussels-Wallonia	51.8%	16.2%	32.1%	
	0.7%	0.2%	0.4%	1.3%	

Morphologic Halleux-index	Not in Belgium	56.4%	7.1%	36.5%	
		0.6%	0.1%	0.4%	1.1%
	Rural	64.3%	20.8%	14.9%	
		0.5%	0.2%	0.1%	0.8%
	Weak	61.8%	22.6%	15.5%	
		3.3%	1.2%	0.8%	5.3%
	Moderate	63.4%	21.1%	15.5%	
	24.3%	8.1%	5.9%	38.3%	
Strong	64.1%	20.9%	15.0%		
	20.9%	6.8%	4.9%	32.7%	
Central Agglomeration	60.4%	19.7%	19.9%		
	13.2%	4.3%	4.3%	21.8%	
<i>Population Composition</i>					
Functional Halleux-index	Not in Belgium	56.4%	7.1%	36.5%	
		0.6%	0.1%	0.4%	1.1%
	Rural	64.3%	20.8%	14.9%	
		0.5%	0.2%	0.1%	0.8%
	Weak	63.5%	21.2%	15.3%	
		28.7%	4.3%	6.9%	54.3%
	Moderate	63.9%	21.5%	14.6%	
	12.9%	4.3%	3.0%	20.2%	
Strong	63.7%	19.9%	16.4%		
	6.9%	2.1%	1.8%	10.8%	
Central Agglomeration	60.4%	19.7%	19.9%		
	13.2%	4.3%	4.3%	21.8%	
Dexia-typology	Not in Belgium	56.4%	7.1%	36.5%	
		0.6%	0.1%	0.4%	1.1%
	Residential	61.5%	22.5%	15.9%	
		13.3%	4.9%	3.5%	21.7%
	Strongly Urbanized	57.3%	12.6%	30.2%	
		0.4%	0.1%	0.2%	0.6%
	Rural	63.5%	21.4%	15.2%	
		11.6%	3.9%	2.8%	18.2%
	Concentrated Economy	63.1%	22.2%	14.8%	
	7.1%	2.5%	1.7%	11.3%	
Central	62.0%	19.9%	18.1%		
	20.1%	6.5%	5.9%	32.4%	
Tourist	57.2%	22.3%	20.5%		
	0.9%	0.3%	0.3%	1.5%	
Semi-urbanized	67.4%	18.2%	14.4%		
	8.9%	2.4%	1.9%	13.2%	
<i>Local Labor Market Opportunities</i>					
Teaching Job Opportunity	Mean	899.89	886.26	872.09	892.49
	Min	0	0	0	0
	Max	1819	1819	1819	1819

## B1.2.2 Model 2: Final Graduates

VARIABLE		TEACHING N = 2 287	ELSEWHERE N = 876	TOTAL N = 3 163
<b>Individual</b>				
<i>Demographics</i>				
Gender	Male	55.1%	44.9%	21.8%
	Female	12.0%	9.8%	78.2%
Nationality	Belgian	77.1%	22.9%	99.2%
	Non-Belgian	60.3%	17.9%	0.8%
Age	Mean	72.4%	27.6%	24.14
	Min	57.7%	42.3%	20
	Max	0.5%	0.3%	51
<i>School Career/Performance/Ability</i>				
Academic Ability	Mean	0.8863	0.8203	0.8680
	Min	0.25	0.33	0.25
	Max	1.00	1.00	1.00
Educational Form	Other	54.7%	45.3%	13.2%
	General	7.2%	6.0%	55.4%
	Technical	70.9%	29.1%	27.9%
	Vocational	39.3%	16.1%	1.4%
	Artistic	81.5%	18.5%	2.2%
Study Break Type	None/Small	22.7%	5.2%	90.6%
	Fallback Career	93.0%	7.0%	3.2%
	Specialization	1.3%	0.1%	5.7%
	Reorientation	84.3%	15.7%	0.5%
Study Break Duration	Mean	1.9%	0.3%	0.17
	Min	74.2%	25.8%	0
	Max	67.2%	23.4%	6

Type of Teaching Diploma	Professional	81.7%	18.3%	64.6.0%	14.4%	79.0%
	Specialization	73.0%	27.0%	0.9%	0.3%	1.2%
	Subject-Specific	34.8%	65.2%	6.9%	12.9%	19.8%
ISCED	Nursery	93.6%	6.4%	15.8%	1.1%	16.9%
	Primary	92.7%	7.3%	24.2%	1.9%	26.1%
	Lower Sec	68.2%	31.8%	24.6%	11.5%	36.1%
	Higher Sec	34.8%	65.2%	6.9%	12.9%	19.8%
	General Support	73.0%	27.0%	0.9%	0.3%	1.2%
Subject-specialty of Highest Diploma	Other/Education	81.1%	18.9%	65.3%	15.3%	80.6%
	Arts, Languages and History	48.7%	51.3%	3.5%	3.7%	7.2%
	Social Sciences	27.5%	72.5%	1.8%	4.7%	6.4%
	Natural Sciences	16.5%	83.5%	0.5%	2.4%	2.9%
	Engineering	0%	100.0%	0.0%	0.1%	0.1%
	Agriculture and Veterinary	0%	100.0%	0.0%	0.1%	0.1%
	Medicine and Health Care	44.0%	56.0%	1.2%	1.5%	2.7%
<i>Parental Support</i>						
Financial Support	None	72.5%	27.5%	59.9%	22.8%	82.7%
	Study Grant	71.5%	28.5%	12.4%	4.9%	17.3%

VARIABLE		TEACHING	ELSEWHERE	TOTAL
<b>Higher Education Institution</b>				
<i>Higher Education Institution Specific Characteristics</i>				
Higher Education Association	Ghent Association	63.7%	36.3%	
		14.1%	8.1%	22.2%
	Antwerp Association	77.5%	22.5%	
		10.0%	2.9%	12.9%
	Limburg Association	75.7%	24.3%	
		1.7%	0.5%	2.2%
	Leuven Association	75.8%	24.2%	
		45.4%	14.5%	60.0%
	Brussels Association	38.8%	61.2%	
		1.0%	1.6%	2.7%
University	College	80.5%	19.5%	
		66.5%	16.1%	82.5%
	University	33.5%	66.5%	
		5.8%	11.6%	17.5%
School Size	Mean	1264.40	1196.09	1245.48
	Min	13	13	13
	Max	1926	1926	1926
<i>Student-Body Composition</i>				
Gender Composition	Mean	24.01	25.48	24.42
	Min	18.30	18.30	18.30
	Max	35.62	35.62	35.62
Nationality Composition	Mean	0.88	0.97	0.91
	Min	0.25	0.25	0.25
	Max	6.21	6.21	6.21
Socioeconomic Composition	Mean	22.64	19.26	21.70
	Min	4.12	4.12	4.12
	Max	34.84	34.84	34.84
Average Academic Ability	Mean	91.04	91.32	91.11
	Min	86.19	86.19	86.19
	Max	97.42	97.42	97.42
<b>Geographical Neighborhood</b>				
<i>Demographic</i>				
Region	Not in Belgium	58.3%	41.7%	
		0.2%	0.2%	0.4%
	Flanders	72.7%	27.3%	
		71.5%	26.9%	98.4%
	Brussels-Wallonia	47.5%	52.5%	
		0.6%	0.7%	1.3%

Morphologic Halleux-index	Not in Belgium	58.3%	41.7%	0.2%	0.4%
	Rural	81.0%	19.0%	0.5%	0.7%
	Weak	76.8%	23.2%	4.3%	5.6%
	Moderate	73.3%	26.7%	27.6%	37.7%
	Strong	74.6%	25.4%	24.8%	33.3%
	Central Agglomeration	66.0%	34.0%	14.8%	22.4%
<i>Population Composition</i>					
Functional Halleux-index	Not in Belgium	58.3%	41.7%	0.2%	0.4%
	Rural	81.0%	19.0%	0.5%	0.7%
	Weak	73.1%	26.9%	34.0%	46.6%
	Moderate	76.1%	23.9%	14.9%	19.6%
	Strong	75.0%	25.0%	7.8%	10.4%
	Central Agglomeration	66.0%	34.0%	14.8%	22.4%
Dexia-typology	Not in Belgium	58.3%	41.7%	0.2%	0.4%
	Residential	71.6%	28.4%	17.7%	24.8%
	Strongly Urbanized	47.1%	52.9%	0.3%	0.5%
	Rural	77.2%	22.8%	13.8%	17.9%
	Concentrated Economy	73.5%	26.5%	8.8%	11.9%
	Central	69.2%	30.8%	22.2%	32.0%
	Tourist	73.6%	26.4%	1.2%	1.7%
	Semi-urbanized	75.4%	24.6%	8.2%	10.8%
<i>Local Labor Market Opportunities</i>					
Teaching Job Opportunity	Mean		888.94	884.14	887.61
	Min		0	0	0
	Max		1819	1775	1819

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