

Evaluation of the FWF Doctoral Programme (DK Programme)

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Research Report

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Executive Summary (German)

Österreich zählte im WS 2013 insgesamt 27.634 ordentliche Doktoratsstudierende und im WS 2012/13 insgesamt 2.165 Doktoratsabschlüsse, wovon 204 PhD-Abschlüsse (9,4%) waren. Im Jahr 2012 hatten insgesamt 7.158 Doktoratsstudierende ein Beschäftigungsverhältnis an einer österreichischen Universität. Hierunter fallen auch jene Doktoratsstudierende, welche im Rahmen der FWF-Programme gefördert wurden und somit eine befristete Anstellung an einer Universität innehatten. Der FWF selbst, der wichtigste nationale Fördergeber im Bereich Grundlagenforschung, finanzierte allein im Jahr 2013 mittels seiner Förderprogramme insgesamt 1.967 Doktorandinnen und Doktoranden.

Das FWF DK-Programm förderte von 2004 bis 2013 insgesamt 1.121 Doktoratsstudierende, von denen bereits insgesamt 302 Studierende (27%) erfolgreich promovierten und 756 Studierende den Status „on-going“ ausweisen. In der Zeitspanne von 2004 bis 2013 wurden insgesamt 136 Anträge im Rahmen des DK-Programms eingereicht, wovon 42 Doktoratskollegs (DK) mittels internationaler Peer Review für die Förderung ausgewählt wurden. Das Fördervolumen dieser 42 DK betrug bislang 130,6 Mio. Euro. Die Entwicklung der Zahlen für die Neuanträge zeigt, dass diese in den vergangenen Jahren stets gestiegen sind, was nicht zuletzt auf das seitens der Hochschulpolitik getriebene Anreizsystem, die Akquisition der kompetitiven Mittel seitens der Universitäten zu erhöhen, zurückzuführen ist. Auf der anderen Seite sieht sich der FWF allerdings mit Budgetrestriktionen konfrontiert, was die Bewilligungsquote im DK-Programm über die Jahre erheblich sinken ließ: So betrug die auf Antragszahlen bezogene Bewilligungsquote im DK-Programm zuletzt im Jahr 2013 31%, jene auf bewilligte Mittel bezogene Bewilligungsquote im selbigen Jahr 24%.

Insgesamt zeichnet sich das DK-Programm dadurch aus, dass es das einzige Programm im Förderportfolio des FWF ist, welches sowohl exzellente Forschungsprojekte als auch explizit ein Ausbildungsprogramm für Doktorandinnen und Doktoranden fördert. Die Förderung der Ausbildung zielt dabei vor allem auf die Sicherstellung exzellenter Rahmenbedingungen für die Ausbildung von wissenschaftlichem Nachwuchs ab.

Bedeutung des FWF DK-Programms

Die Grundidee, mit dem DK-Programm optimale Rahmenbedingungen für die Doktoratsausbildung prototypisch für alle Disziplinen zu schaffen, war richtig und wichtig und kam mit seiner Implementierung vor über zehn Jahren zur richtigen Zeit. Die der Programmidee zugrundeliegende Vision, die Promotionskultur insbesondere auch in den Sozial- und Geisteswissenschaften grundlegend zu ändern, konnte bislang jedoch nicht umfassend realisiert werden. Als Gründe hierfür können genannt werden, dass zum einen die Mehrzahl der in den Sozial- und Geisteswissenschaften laufenden DK noch sehr jung ist, zum anderen dass die Ursache für das nach wie vor weit verbreitete Meister-Schüler-Modell historisch gewachsen ist und in den (je nach Disziplin unterschiedlich gelebten) tief verankerten Promotionskulturen zu suchen ist.

Jenseits dieser Evidenz lautet allerdings die allseits mit Spannung gestellte Frage: *Hat das DK-Programm etwas in der Doktoratsausbildung an den österreichischen Universitäten bewegt, hat es die richtigen Anreize gesetzt?* Diese Frage ist definitiv mit „ja“ zu beantworten. Dem FWF ist es gelungen, durch das DK-Programm neue Wege in der Doktoratsausbildung zu beschreiten und die strukturierte Doktoratsausbildung mit zugrundeliegender guter Forschung als Vorbild an den österreichischen Universitäten zu exemplifizieren. Auch ist es gelungen, mit dem DK-Programm engagierte, in Forschung und Lehre ausgewiesene Wissenschaftlerinnen und Wissenschaftler anzusprechen, wobei das DK-Programm als *Exzellenzprogramm* angesehen wird. Die Qualitätssicherung durch den FWF, im Speziellen das mit ausschließlich ausländischen Gutachterinnen und

Gutachtern besetzte *Peer Review*-Verfahren, ist für diesen Erfolg unbestritten als maßgeblich relevant anzusehen.

Wie gut läuft das DK-Programm?

Das DK-Programm läuft sehr gut, vor allem in den Life Sciences (knapp die Hälfte aller seit 2004 finanzierten DK sind im Bereich der Life Sciences etabliert). Als Erfolgsfaktoren sind der interdisziplinäre Ansatz, die Teambildung sowohl auf Seite der Studierenden als auch auf Seite der Faculty, die kritische Masse von Doktorandinnen und Doktoranden in einem Forschungsfeld (begünstigt durch die Möglichkeit, auch assoziierte Kollegiatinnen und Kollegiaten in ein DK aufzunehmen) und dadurch dessen Sichtbarkeit zu erhöhen, zu nennen. Die Sichtbarkeit des DK steigt mit seiner Laufzeit.

Die Motivation für die Wissenschaftlerinnen und Wissenschaftler, ein DK zu beantragen, liegt vor allem in der Aussicht auf eine langfristige Finanzierung (die maximale Förderdauer beträgt 12 Jahre). Auch die Möglichkeit, talentierte Nachwuchswissenschaftlerinnen und Nachwuchswissenschaftler zu fördern wird von den DK-Leiterinnen und DK-Leitern genannt. Darüber hinaus bewerten diese das *Bottom-up* Prinzip des Programms als essentiell in Bezug auf die Möglichkeit, Forschungsthemen frei zu wählen zu können.

DK werden in der Regel in den (durchaus weitgefasst definierten) universitären Forschungsschwerpunkten aufgebaut und kooperieren dabei auch mit anderen institutionalisierten Förderprogrammen, insbesondere mit den ebenfalls vom FWF geförderten Spezialforschungsbereichen (SFBs) und den Christian Doppler Labors. Diese Zusammenarbeit mit anderen Förderprogrammen, deren Intensität wiederum von der Disziplin abhängig ist, dient mitunter dazu, die Ressourcenallokation anderer Programme durchaus auch für die DK zu nutzen. In den Geistes- und Sozialwissenschaften stellen hier anstelle der Großforschungsprojekte insbesondere die Einzelprojekte eine wichtige zusätzliche Finanzierungsquelle für die DK dar. In Summe wird dem DK-Programm von den DK-Leiterinnen und DK-Leitern somit konstatiert, dass es neben den SFBs das einzige Förderprogramm ist, welches an den österreichischen Universitäten „*substanzbildend*“, im Sinne des Aufbaus von nachhaltigen Forschungskompetenzen, ist.

Internationalisierung

Internationalisierung geschieht in den DK im Wesentlichen durch: (1) die Rekrutierung von internationalen Doktorandinnen und Doktoranden und (2) die Option, die Förderdauer um ein weiteres, viertes Jahr für eine Kollegiatin bzw. einen Kollegiaten zu verlängern, vorausgesetzt es wurde ein dreimonatiger Auslandsaufenthalt absolviert.

Die internationale Rekrutierung wird in den DK weitgehend umgesetzt (im Durchschnitt kommen 57% der Doktoratsstudierenden pro DK aus dem Ausland); dies trägt wesentlich zur Sichtbarkeit der DK bei. Für die Sichtbarkeit und für die Rekrutierung guter Nachwuchswissenschaftlerinnen und Nachwuchswissenschaftler ist immer auch die Reputation/Strahlkraft der Universität ausschlaggebend. Offenbar bringt die internationale Rekrutierung allerdings auch ein gewisses Maß an Risiko mit sich, welches sich wohl darin konstatieren lässt, dass es nicht immer gelingt, die Beststudierenden auszuwählen. Nichtsdestotrotz wird die internationale Rekrutierung für die Doktoratsausbildung *grosso modo* als sehr wertvoll erachtet und als Mehrwert für die DK und die Universitäten angesehen.

Die Option, die Förderdauer pro interne Kollegiatin bzw. internen Kollegiaten auf vier Jahre zu erhöhen, vorausgesetzt es wird im Rahmen der ersten drei geförderten Jahre ein dreimonatiger Auslandsaufenthalt in Anspruch genommen, und damit auch die Kopplung der Finanzierung an einen Auslandsaufenthalt werden in der praktizierten Regelung von der Mehrheit der DK-Leiterinnen und DK-Leiter wie auch von der Studierendenvertretung (doktorat.at) als nicht immer förderlich angesehen. Vielmehr wird das *Credo* vertreten,

dass Auslandsaufenthalte „für das Forschungsprojekt dienlich“ sein sollten. Für einige Forschungsprojekte ist es offenbar von größerer Bedeutung, kurzfristige Aufenthalte wahrzunehmen, während in anderen Fällen ein langfristiger Aufenthalt für den Projektfortschritt und/oder für die (Weiter)Entwicklung der Studierenden passend ist. Angesichts dessen ist es auch ein Anliegen, kommuniziert von DK-Leiterinnen und DK-Leitern, hier seitens des FWF flexiblere Möglichkeiten zu schaffen.

Davon abgesehen ist festzuhalten, dass gerade die internationale Vernetzung und dadurch die stets wachsende Anzahl an Kooperationen und Kooperationspartnern nicht nur für die Studierenden selbst sondern sehr wohl auch für die *Faculty* einen viel beachteten, essentiellen Mehrwert bringen.

Finanzierung von Kollegiatinnen und Kollegiaten

Grundsätzlich ist die Förderdauer von internen Kollegiatinnen und Kollegiaten mit drei Jahren begrenzt. Wie bereits erwähnt, kann ein weiteres viertes Jahr gefördert werden, sofern innerhalb der ersten dreijährigen Förderdauer ein zusammenhängender dreimonatiger Auslandsaufenthalt absolviert wird. Die Interviews mit den DK-Leiterinnen und DK-Leitern zeigen, dass es an dieser praktizierten Regelung durchaus Kritik gibt. Der für die Verlängerung der Förderdauer vom FWF geforderte Auslandsaufenthalt von drei Monaten in den ersten drei Jahren der Förderung wird in vielen Fällen als zu lang angesehen. Tatsächlich nehmen in der Praxis viele Kollegiatinnen und Kollegiaten diese Regelung des FWF nicht in Anspruch, womit sie vor der Herausforderung stehen, ihre Promotion in drei Jahren abzuschließen oder für eine eventuell notwendige Verlängerung ihrer Studienzeit zusätzliche finanzielle Mittel zu akquirieren. Ferner zeigen die in den Interviews kommunizierten Erfahrungen, dass die Anzahl der Kollegiatinnen und Kollegiaten, die ihren Abschluss innerhalb von drei Jahren erlangen, nur gering ist.

Leider ist es nicht möglich, auf Basis der vorhandenen Daten signifikante Aussagen zum Studienerfolg in den DK zu machen, auch für die Berechnung der Studiendauer der Kollegiaten ist die Datenlage unzureichend. In der Vergangenheit konnten allerdings verschiedene Studien deutlich machen, dass sich die Studiendauer disziplinär unterschiedlich gestaltet (Enders und Kottmann, 2009; Bornmann und Enders 2002). Für die Zukunft schlagen wir daher vor, dieser Sachlage anders als bisher zu begegnen: Bei der Förderung von Nachwuchswissenschaftlern sollte es ein Anliegen des FWF sein, talentierten Nachwuchswissenschaftlerinnen und Nachwuchswissenschaftlern genügend Zeit zu geben, um exzellente und hochqualitative Forschung betreiben zu können. Folglich sollte diesem Aspekt bereits in der Antragstellung Raum gegeben werden, indem von den Antragstellerinnen und Antragstellern bei der Beschreibung der zu fördernden Projekte eine realistische Einschätzung des Arbeitsaufwandes vorgenommen wird. Die Laufzeit der Arbeit bzw. die Studiendauer, ob drei oder vier Jahre notwendig sind, sollte daher bereits im Rahmen des Antragsverfahrens bestimmt und hier auch begründet werden.

Anstellung und Chancengleichheit

In der Regel befinden sich im Rahmen eines DK alle (internen) Kollegiatinnen und Kollegiaten in einem Anstellungsverhältnis von 75% nach Kollektivvertrag an der Universität; dies entspricht einer 30-Stunden Woche. Die Anstellung von Doktorandinnen und Doktoranden wird sowohl von den Studierenden als auch von der überwiegenden Mehrheit der DK-Leiterinnen und DK-Leiter als ein ganz zentraler Mehrwert der DK gesehen. Teils wird die 75%-Anstellung (vor allem an den Technischen Universitäten) durch weitere Drittmittel zu einer Vollanstellung aufgewertet. Nur einige wenige DK-Leiterinnen und DK-Leiter würden anstelle der jetzigen Regelung ein Stipendiensystem begrüßen. Letzterem steht jedoch eindeutig das *Commitment*, gemäß der *European Charter for Researchers* und dem *Code of Conduct for the Recruitment of Researchers*

Doktoratsstudierende als ‚*early stage researchers*‘ anzusehen und ihnen damit Anstellung und soziale Absicherung zu gewähren, entgegen.

Das DK-Programm fördert darüber hinaus pro-aktiv Frauen in Wissenschaft und Forschung, mittels einer empfohlenen 30%-Quote insbesondere auch Frauen auf der Ebene der *Faculty*. Die Evaluierung zeigt, dass auf der Ebene der Studierenden bereits eine annähernde gleiche Beteiligung von Frauen und Männern erreicht wurde; so befinden sich im Durchschnitt 46% Frauen unter den Doktoratsstudierenden pro DK. Auf der Ebene der *Faculty* besteht zwar häufig ein Bewusstsein darüber, die Beteiligung von Frauen zu vergrößern; allerdings ist dieses – abhängig von der jeweiligen Disziplin nur schwer umzusetzen. Häufig ist das Quotenziel – den gegebenen Umständen entsprechend (niedrigerer Anteil an Professorinnen, ein zu geringer Nachweis von guter wissenschaftlicher Forschung etc.) – auf der Ebene der *Faculty* nicht realisierbar. Folglich unternehmen DK-Leiterinnen und DK-Leiter häufig Anstrengungen, dieses Ungleichgewicht zumindest auf der Ebene der Studierenden zu kompensieren. Allerdings stellt das Ansteigen der Frauenquote in den DK die Leiterinnen und Leiter zunehmend auch vor neue Herausforderungen. Diese zeigen sich vor allem in jener Hinsicht, als dass das Thema Vereinbarkeit von Familie und Beruf auch in den DK zunehmend an Bedeutung gewinnt und hier gefordert wird, dass in Zukunft adäquate Rahmenbedingungen geschaffen werden müssen.

Das DK-Programm aus Sicht der Universitäten

Das DK-Programm gilt universitätsintern als Exzellenzprogramm, die DK tragen den „*Exzellenzstempel*“ des FWF – ein Nachweis, der angesichts der hoch angesehenen Qualitätsprüfung und -sicherung durch den FWF als unangreifbar angesehen wird. Diese durch den FWF nachgewiesene Exzellenz legitimiert auch, ein *Commitment* (zusätzliche Mittel, Infrastruktur etc.) von der jeweiligen Universitätsleitung einzufordern. In diesem Sinne werden DK seitens der Universitätsleitung durchaus auch als kostspielig wahrgenommen. Wie groß die Unterstützung für ein DK ist, hängt von den finanziellen Möglichkeiten der jeweiligen Universität und wohl auch von den handelnden Personen ab. Darüber hinaus werden die DK auch als wichtiges strategisches Instrument zur Profilbildung von Universitäten eingesetzt. Nicht zuletzt werden in den jeweiligen Leistungsvereinbarungen mit dem Bund die Ziele und Vorhaben bezüglich Einrichtung und Weiterführung von DK explizit dargelegt.

Hebelwirkung auf die Doktoratsausbildung

Je länger ein DK an einer Universität etabliert ist, umso größer ist seine Sichtbarkeit und umso mehr Breitenwirkung zieht es nach sich. In der Regel sind zahlreiche Lehrveranstaltungen wie Vorlesungen, Vorträge von Gastwissenschaftlerinnen und Gastwissenschaftlern etc. offen für alle Doktoratsstudierende, während speziell für das DK konzipierte Kurse wie z.B. *hands on training courses* in Laboratorien Kollegiatinnen und Kollegiaten vorbehalten sind. Inwieweit sich das PhD-Studium im Rahmen eines DK vom regulären PhD- bzw. klassischen Doktoratsstudium unterscheidet, hängt ganz wesentlich von der jeweiligen Disziplin und Institution ab. An manchen Departments gibt es praktisch keinen Unterschied zwischen den beiden Promotionsformen, wiewohl das strukturierte Studium im Rahmen der DK *Add-ons* wie etwa die Übernahme der Kosten eines Koordinators, die Finanzierung der Rekrutierung, die Übernahme von Reisekosten, die Option auf einen längerfristigen Auslandsaufenthalt, die Einladung von Gastwissenschaftlerinnen und Gastwissenschaftlern, die Finanzierung von *Summer Schools* etc. enthält.

Was die Struktur des Doktoratsstudiums betrifft, so gibt es durchaus Unterschiede, wie dieses in- und außerhalb der DK aufgebaut bzw. gestaltet ist. So ist die Form des strukturierten Doktoratsstudiums vor allem für die Life Sciences typisch. Auch in den Natur- und Technischen Wissenschaften hat sich bereits teilweise (abhängig von der Fakultät) die strukturierte Doktoratsausbildung gut durchgesetzt. Kaum eine Ausbreitung des

strukturierten Doktoratsstudiums ist allerdings in den Sozial- und Geisteswissenschaften festzustellen. Hier ist die Hebelwirkung des DK-Programms (unter Berücksichtigung, dass die Mehrzahl der hier etablierten und derzeit laufenden DK noch sehr jung ist) gering bzw. nicht gegeben; das bedeutet auch, dass der Unterschied zwischen einem klassischen Doktoratsstudium und einem strukturierten Studium im Rahmen eines DK gerade in den Human-, Sozial- und Wirtschaftswissenschaften nach wie vor groß ist; das bringt auch mit sich, dass hier nach wie vor im regulären Studium das Meister-Schüler-Modell vorherrschend ist. Dementsprechend wird das strukturierte Studium im Rahmen eines DK auch als ein sehr hoch spezialisiertes Studium wahrgenommen, welches speziell Nachwuchswissenschaftlerinnen und Nachwuchswissenschaftler mit dem Ziel einer akademischen Karriere adressiert.

Die komplementäre Rolle des DK-Programms

Österreichs Universitäten haben in den vergangenen Jahren begonnen, selbst Initiativen in der strukturierten Doktoratsausbildung zu setzen, wobei der Anstoß hierzu vor allem auf die europäischen Entwicklungen (vor allem auf Bologna) zurückzuführen ist. In diesem Zusammenhang hat auch das DK-Programm einen Beitrag geleistet, da von ihm die Implementation strukturierter Elemente in der Doktorandenausbildung finanziert wurden. Die Initiativen und Aktivitäten von Österreichs Universitäten in der strukturierten Doktoratsausbildung sind vielfältig: So hat z.B. die Universität Wien zur Vorbereitung von DK *Initiativkollegs* ins Leben gerufen, die mittlerweile von den sogenannten *Vienna Doctoral Academies* sowie von einer Förderung von Individualpromotionen (*uni:docs*) abgelöst werden. Auch haben die Universität Graz und die Technische Universität Graz sogenannte *Doctoral Schools* etabliert. Die Medizinischen Universitäten mussten überhaupt angesichts der Bologna-Umstellung neue Curricula für das Doktoratsstudium entwickeln und haben im Zuge dessen auch PhD-Programme eingeführt. Darüber hinaus haben auch die Medizinischen Universitäten wie z.B. die Medizinische Universität Graz *Doctoral Schools* in Anlehnung an die Richtlinien des DK-Programms eingeführt. Letzere obliegen auch der Qualitätssicherung des FWF.

Insgesamt wurde somit eine Reihe von neuen Richtlinien, Curricula etc. für PhD/Doktorats-Studiengänge unter Einbeziehung und Berücksichtigung der Erfahrungen, welche im Rahmen des DK-Programms gemacht wurden, erstellt bzw. werden diese bereits auch an den Universitäten umgesetzt. Die Finanzierung von Doktoratsstudierenden wird dabei sehr unterschiedlich gehandhabt. So finanzieren manche Universitäten (wie z.B. die Universität Wien, die Universität Salzburg oder die Veterinärmedizinische Universität) Doktoratsstellen, wenn auch in manchen Fällen nur eine Teilzeitanstellung. Andere Universitäten (wie z.B. die Universität Klagenfurt) stellen keinerlei Finanzierung für Doktoratsstellen im Rahmen ihrer *DoktorandInnenkollegs* bereit. Wiederum andere Universitäten (wie z.B. die Medizinische Universität Wien) stellen Mittel für zusätzliche Doktoratsstellen im Rahmen der FWF-DK bereit bzw. übernehmen die Weiterfinanzierung von Doktoratsstellen nach Auslaufen der DK für eine bestimmte Zeitdauer (wie dies z.B. an der Wirtschaftsuniversität Wien geschieht).

All diese Initiativen und Aktivitäten haben einen gemeinsamen Nenner: Sie bestärken den Schritt, in Richtung strukturierte Doktoratsausbildung weiter zu gehen – im Bewusstsein, dass die Qualität des Doktoratsstudiums in Österreich weiterhin steigen muss. Eine Qualitätssteigerung schließt dabei eine Bündelung von Ressourcen, eine Nutzung von Synergien und damit einen gezielten strategischen Einsatz von strukturbildenden Maßnahmen, welche primär auch der Profilbildung der jeweiligen Universität selbst dienen sollen, ebenso mit ein wie ein taktisches Vorgehen, den bislang „ungeregelten“ Hochschulzugang in Österreich handzuhaben. Allerdings zeigt sich, dass die Ressourcenausstattung der universitätseigenen Initiativen und Aktivitäten im Bereich der Doktoratsausbildung nicht annähernd den Umfang und damit den Mehrwert des FWF DK-Programms erreichen. Angesichts dessen ist auch zu konstatieren, dass das FWF DK-Programm nach wie vor eine essentielle, komplementäre Rolle gegenüber den universitätseigenen Initiativen einnimmt.

Commitment gegenüber den DK

Angesichts steigender Antragszahlen für DK und des zugleich aber bestehenden Budgetengpasses seitens des FWF stellt sich die Frage, inwieweit die Universitäten in der Lage sind, ihr *Commitment* bezüglich der Einrichtung und Aufrechterhaltung von DK zu erhöhen. Zentral ist hier vor allem die Frage, inwieweit und zu welchem Zeitpunkt es realistisch ist, dass Universitäten Kosten der DK übernehmen, nicht zuletzt mit dem Ziel, den Finanzierungsbeitrag des FWF zu reduzieren. Zu diesem Zweck wurden unterschiedliche Szenarien entwickelt und mit den DK-Leiterinnen und DK-Leitern sowie Rektorinnen und Rektoren und Vize-Rektorinnen und Vize-Rektoren österreichischer Universitäten diskutiert. Die Diskussion zeigt, dass die derzeitige finanzielle Ausstattung der Universitäten kein zusätzliches *Commitment* (im Sinne einer Übernahme von weiteren Kosten) möglich macht. Dies wird vor allem durch das Faktum, dass der FWF für Großforschungsprojekte (und somit auch für DK) keine Overhead-Zahlungen leistet, bestärkt.

Szenarien, welche lediglich eine Anschubfinanzierung durch den FWF oder überhaupt über die Zeit eine weitreichendere Kostendeckung seitens der Universitäten andeuten, werden angesichts der aktuellen budgetären Ausstattung seitens der Universitäten allesamt als nicht praktikierbar, ja gar als „*illusorisch*“ gewertet. Lediglich von wenigen DK-Leiterinnen und DK-Leitern wird die Möglichkeit einer graduellen Reduktion der Fördermittel seitens des FWF über die gesamte Förderlaufzeit hinweg als ein optionaler Ausweg in Erwägung gezogen. In Summe aber halten gerade die Vertreterinnen und Vertreter der Universitäten daran fest, bereits jetzt ein sehr hohes *Commitment* (Bereitstellung von zusätzlichen finanziellen Mitteln, Kostenübernahme zusätzlicher Stellen für Doktoratsstudierende, Zurverfügungstellung von Infrastruktur wie z.B. Labors, Reduktion der Lehrverpflichtung von DK-Leiterinnen und DK-Leitern etc.) gegenüber den DK zu leisten. Folglich halten die interviewten Universitätsvertreterinnen und -vertreter auch fest, angesichts der aktuellen Rahmenbedingungen keine weitere Finanzierungsverantwortung hinsichtlich der DK übernehmen zu können.

Conclusio

Die vorliegende Evaluierung des FWF DK-Programms zeigt, dass das DK-Programm sehr gut läuft. Das DK-Programm wird sowohl seitens der Wissenschaftlerinnen und Wissenschaftler als auch seitens der Universitätsvertreterinnen und -vertreter als *Exzellenzprogramm* wahrgenommen. Es hat in diesem Sinne viele seiner Programmziele (gute Forschungsperformance, strukturierte Doktoratsausbildung, Internationalisierung etc.) erreicht. Auch war bzw. ist das DK-Programm impulsgebend für die Weiterentwicklung/Qualitätsverbesserung der Doktoratsausbildung an den österreichischen Universitäten. Hier nimmt das DK-Programm bis heute eine Vorbildfunktion aber auch eine finanziell essentielle, komplementäre Rolle ein.

Dennoch zeigen Erfahrungen in anderen europäischen Ländern, dass sich der Ansatz der Doktoratsausbildung in den vergangenen Jahren verändert bzw. weiterentwickelt hat. Diese Veränderung bzw. Weiterentwicklung liegt darin, dass gerade in den nordeuropäischen Ländern (wie in Dänemark, Norwegen und Finnland) die Ausbildungsfunktion des Doktoratsstudiums in den Vordergrund gerückt ist und das Ziel verfolgt wird, die Zahl der Doktoratsabschlüsse zu erhöhen. Demgemäß haben hier auch Ministerien verstärkt in die Finanzierungsmechanismen der Doktoratsausbildung eingegriffen. Zugleich sind die Hochschulen in die Verantwortung genommen worden, für das Angebot einer qualitativ hochwertigen (strukturierten) Doktoratsausbildung zu sorgen. Damit wird in diesen Ländern die Doktoratsausbildung auch vorwiegend institutionell, d.h. mitunter auch im Rahmen zweckgebundener Mittel, finanziert. Diese Umstellung der Finanzierungsstruktur hatte schließlich auch zur Folge, dass sich die Förderagenturen im Hinblick auf die Förderung von Doktoratsstudierenden anpassen bzw. neu ausrichten mussten.

Österreich verfolgt in der Doktoratsausbildung bislang zwei unterschiedliche, komplementäre Wege: Zum einen wird die Finanzierung der Doktoratsausbildung mittels Globalbudget der Universitäten gedeckt, zum anderen

werden auf kompetitivem Weg zusätzliche Mittel (wie im Rahmen des DK-Programms) zur Verfügung gestellt. Beide Finanzierungsmechanismen werden als unabdingbar, essentiell angesehen und tragen heute dazu bei, die Doktoratsausbildung im österreichischen Hochschulsystem aufrecht zu erhalten. Blickt man in die Zukunft, so ist es ein im Regierungsabkommen verankertes Ziel, in Österreich (dem internationalen Trend folgend) eine Studienplatzfinanzierung einzuführen. Wird dieses Ziel angestrebt, so wird es wohl auch notwendig sein, sich über die Ausrichtung des Doktoratsstudiums sowie seine Finanzierung Gedanken zu machen. Vor dem Hintergrund dieser (möglichen) Entwicklung kann sich daher auch für das DK-Programm die Notwendigkeit ergeben, sich langfristig neu zu orientieren. Bis zu diesem Zeitpunkt jedoch soll das FWF DK-Programm fortgeführt werden – unter der Prämisse, hochrangige Forschungsvorhaben und talentierte Doktoratsstudierende zu fördern.

Executive Summary

In the winter term 2013 a total of 27,634 doctoral students were enrolled at Austrian universities and a total of 2,165 students obtained a doctoral degree; thereof 204 (9.4%) students graduated in a PhD Programme. In total 7,158 doctoral students were employed at Austrian universities in 2012. These numbers include those doctoral students with temporary positions who were funded by competitive means, as provided by the funding programmes of the FWF. In total the FWF as the most important funding agency for basic research in Austria funded 1,967 doctoral candidates in 2013.

In the period from 2004 to 2013 the FWF Doctoral Programme funded 1,121 doctoral candidates. From these 302 (27%) have already successfully completed their doctoral degree, while 756 doctoral candidates had the status of an 'on-going' student at the time of data collection. In this period the FWF received about 135 DK proposals, from these 42 were selected for funding in an international peer review. The budget for these 42 Doktoratskollegs (DK) amounts to 130.6 million Euros. In the recent years the number of first proposals for the DK Programme has been increasing. This is also due to a change in the governmental steering of higher education: Different incentives to increase the acquisition of competitive means have been implemented. However, as the FWF has to face serious budget constraints the approval rate of new proposals has been strongly decreasing in the recent years. In 2013 the approval rate of proposals for the first funding period was at 31% related to the number of proposals that have been handed in. Looking at the budget that has been applied for about 24% have been funded in 2013.

A special characteristic of the FWF DK programme (compared to other FWF funding schemes) is that it is the only programme that funds excellent research as well as the training of young researchers. The funding of the training of young researchers aims in particular at establishing a well-functioning and excellent training environment for the most talented young researchers.

The significance of the FWF DK Programme

The vision to create and support an excellent environment for doctoral training that should serve as a role model across disciplines has proven to be very appropriate. So far, the idea to change the cultures of doctoral training also in the Social Sciences and Humanities fundamentally has not been realized to its fullest extent. Different reasons account for this: on the one hand the DK implemented in these disciplines are still quite young. On the other hand it has to be considered for these disciplines that the master-apprentice model is deeply ingrained in their doctoral training cultures. When looking at the overall performance *of the DK programme, its impact on doctoral training at Austrian universities, and the incentives that the programme provided for the reform of doctoral training* it can be stated that the DK Programme has achieved these goals to a very high extent. With the DK Programme new forms of doctoral training, in particular structural doctoral training based on excellent research, have been implemented as role models at Austrian universities. The DK Programme appeals high-level researchers and is rated as an excellence programme by institutions inside and outside academia. In this respect stakeholders emphasise the importance of the quality assurance mechanisms that have been established by the FWF; in particular the international peer review is seen as a major factor for these achievements.

How does the DK Programme perform?

The FWF DK Programme performs very well, in particular in the Life Sciences where almost half of the DK that have been funded DK since 2004 have been established. As main success factors the interdisciplinary approach,

the team building among students and faculty, the building of a critical mass in specific research fields and the promotion of visibility can be mentioned. The possibility to include associated doctoral candidates is very much welcomed as it further contributes to the visibility of a DK. Also, DK gain more visibility the longer they are established.

The long funding of up to 12 years at maximum builds an important incentive for Principle Investigators to apply for a DK; also the possibility to promote and train bright, talented early stage researchers is an asset to apply for a DK. A further asset of the programme is its bottom-up principle. Here researchers are allowed to choose their research topics freely, i.e. they are not bound to any thematical limitation of the funding scheme.

Most of the DK are established in research fields where universities have already built up competences and allocate resources. Here in particular the Special Research Centers (SFB) of the FWF and the Christian Doppler Laboratories play an important role as they provide additional resources for the DK. The strength of collaboration is determined by the discipline. In the Social Sciences and Humanities the DK often collaborate with stand-alone research projects. All in all, the majority of Principal Investigators stated that the DK Programme is the only funding programme (besides the Special Research Programs) that supports the establishment of sustainable research capabilities at Austrian universities.

Internationalisation

In the DK internationalisation is mainly facilitated by (1) the recruitment of international doctoral candidates and (2) the optional fourth year of funding for those internal doctoral candidates that have been spending three months abroad within the first three years of funding.

The recruitment of international doctoral candidates has been realized to a large extent in the DK (on average 57% of the doctoral candidates per DK come from abroad); this strongly contributes to the visibility of the DK. International visibility and the recruitment of the most talented doctoral candidates also depends on the reputation of the host institution. There are some risks associated with the international recruitment, as stakeholders reported that they are not always able to select the best students. Nonetheless, the international recruitment is very much appreciated by the majority of the respondents and regarded as an added value for the DK as well as the host universities.

As regards the rule to award a fourth year of funding in case the doctoral candidate has been abroad for about three months within the first three years of funding the majority of the Principal Investigators and the representative of doktorat.at were critical as this would couple funding too strongly to internationalisation activities. These advocates would prefer that research stays abroad should mainly serve the actual research project and the training of the individual students as some research projects would require only short stays abroad while for others longer research stays would be adequate. In this respect the respondents indicated that a more flexible regulation would be very much appreciated.

All in all, it has to be stated that the opportunities to internationalize in the DK Programme, i.e. to engage in international cooperation and networks is very much recognized as an important added value by the doctoral candidates as well as the faculty of the DK.

Funding of internal doctoral candidates

In general, internal doctoral candidates are funded for a three-year period by the DK Programme. The funding period can be extended by an additional fourth year in case the doctoral student spends a continuous research stay of three months abroad. The length of this continuous research stay is considered as too long by a number of the Principal Investigators of the DK. Also, in practice the majority of the internal doctoral candidates do not

use this opportunity to prolong their funding. This requires them to either complete their doctoral studies within the time frame of three years or to raise additional funds to extend their time of doctoral studies. Here in most interviews it was reported that only a limited number of doctoral candidates has completed their doctoral study within the three year funding period.

Unfortunately, due to missing data we are not able to make reliable conclusions on the success of doctoral candidates and their time-to-degree in the DK. Because of confidentiality reasons not all data on this issue were accessible for the evaluation team. Nonetheless, different studies show that the time to degree differs by discipline (Enders and Kottmann, 2009; Bornmann and Enders, 2002). For the future we recommend to change the regulations as regards the funding periods of doctoral students. For the funding of young research talent the FWF should consider that conducting excellent and high quality research needs an adequate amount of time. Thus, the needs of the planned research should become a major factor in the determination of the funding period. Therefore it should already be stated in the project proposals whether three or four years will be needed to complete the planned research.

Employment and gender equality

In general all internal doctoral candidates are employed in the framework of the collective agreement for an amount of 75% of full-time employment at their host institutions; that are about 30 hours per week. The possibility to employ doctoral candidates is valued as a major asset of the DK Programme by the representatives of the doctoral candidates as well as by the majority of the Principal Investigators. At some institutions, in particular at technical universities the employment is amended to a full-time position by additional funds from other project fundings etc. Only very few Principal Investigators stated that they would prefer to provide the funding by fellowships rather than by employment. This would definitely not be in line with *the European Charter for Researchers* and *the Code of Conduct for the Recruitment of Researchers* that aims at realising good working conditions for early stage researchers.

The DK Programme actively supports female talent in science, this is done by a 30% quota for females among faculty. From the data it became clear that among doctoral students nearly a balance in the participation of females and males has been achieved: on average about 46% of the students in the DK were females. At the faculty level there was a growing awareness about the goal to increase the percentage of females among the faculty members. Unfortunately the goal has not been realized yet. Depending on the discipline it is hard to realize the integration of a sufficient number of females: in some disciplines there are only a few female professors, also a lack of excellent research among female faculty was mentioned here. Most of the speakers of DK tried to compensate the lack of female faculty by increasing the number of female doctoral students. This practice confronts the speakers of DK with new challenges: practices in achieving a more family friendly work environment are discussed, additionally it was mentioned that more family friendly regulations need to be developed.

Universities' views on the DK Programme

In the view of the university managements the FWF Doctoral Programme is an excellence scheme, the DK are internally brand marked as excellent. This view is strongly supported by the quality assurance implemented by the FWF. Because of this excellence confirmed by the FWF allows researchers to request commitment by the university management in terms of additional funds and resources. In this respect the DK are sometimes evaluated as expensive. The kind and amount of support provided for the DK strongly depends on the university's budget and the actors involved. While representatives of the university management strongly welcome the establishment of a DK as a means to strengthen the profile of their institution. The performance

agreements between the universities and the federal government also explicitly consider the establishment of new and the continuation of existent DK.

Impact of DK on doctoral training

The visibility and the impact of a DK at universities depend to a large extent on the time it has been existing at its host institution. Generally, the majority of (guest) lectures and some other training events are open to all doctoral students at the host institution. Only a number of trainings that have in particular been designed for the DK (like hands on training in laboratories) are limited to the doctoral students of the DK. To what extent the doctoral training in the DK is different from doctoral training outside a DK is mainly dependent on the discipline and also the host institution. At some departments there is actually no difference between the both forms of training, here the DK mainly provide add-ons to doctoral training like the funding of a coordinator, international recruitment, travel costs, research stays abroad, the chance to invite international guest researchers or the funding of summer schools.

There are also differences in the way doctoral training inside and outside the DK is organized. In particular in the Life Sciences structural forms of doctoral training are already common. Also in the Natural and Technical Sciences structural forms of doctoral training became more widespread (also depending on the faculty). In the Social Sciences and Humanities structural doctoral training only plays a minor role. In this disciplines the DK only function as a leverage to a very limited extent. This is also due to the fact that there are only a few DK established in these disciplines and that most of these are still young. Thus, doctoral training outside the DK is very different from training inside the DK for these disciplines, and the traditional master-apprenticeship is still prevalent here. In line with this the DK are regarded as highly specialised training centres that in particular prepare for an academic career in the Social Sciences and Humanities.

The complementary role of the DK Programme

In the recent years Austrian universities started own initiatives in structural doctoral training. These were mostly related to the developments on the European level, in particular the Bologna process. Also the implementation of the DK Programme has contributed to this development as it funds the implementation of structural elements in doctoral training. Besides this, there is a multitude of different initiatives to reform doctoral training in Austria. At the University of Vienna for example the so-called *Initiativkollegs* have been implemented. These are currently replaced by the Vienna Doctoral Academies and the funding of individual doctorates (*uni:docs*). At the University of Graz and Technical University of Graz Doctoral Schools have been implemented. Also at Medical Universities PhD programmes became more widespread as these institutions had to change their curricula in line with the Bologna reforms. Some Medical Universities also established doctoral schools, e.g. the Medical University of Graz. Here the guidelines of the FWF DK Programme served as a role model; also the quality assurance of the doctoral schools is organized by the FWF.

Summarizing these developments there are a number of initiatives and reforms implemented at universities that build on the experiences that were made within the framework of the FWF DK Programme. For the funding of doctoral candidates a number of different models have been implemented: Some universities (University of Vienna, University of Salzburg, Veterinary University) fund positions for doctoral candidates, also as part-time employment. Other universities do not fund positions for doctoral candidates in the framework of their doctoral schools (e.g. University of Klagenfurt). Some universities also provide additional positions for doctoral candidates in the FWF DK (e.g. Medical University of Vienna), other prolong the funding of doctoral candidates for a limited period in case the funding for the FWF DK stops (e.g. University of Economics Vienna).

In total all of these initiatives and activities have a common goal: they motivate to further proceed with the implementation of structural doctoral training and to increase the quality of doctoral studies in Austria. The increase in the quality of doctoral study should include a more sensitive usage of resources and synergies and the strategic linkage of those initiatives to the profile building of the universities. Also, a more tactical approach in the regulation of the so far open access to doctoral studies in Austria should be considered. Nonetheless, when considering further changes it should be clear that the resources of universities are limited, they cannot provide as many resources as the FWF DK Programme and might in their initiatives not achieve a similar effect. In this respect it has to be stated that the FWF DK has a very important complementary role to the initiatives and activities implemented by universities.

The university's commitment

Facing the increasing numbers of applications for the FWF DK Programme and the current budget constraints of the FWF it has to be investigated to what extent the universities will be able to increase their commitment towards the DK. In particular the question to what extent the universities can realistically contribute to the costs of a DK in order to decrease the funding provided by the FWF. Therefore in the evaluation different scenarios on the future funding of the DK have been discussed with the Principal Investigators of the DK and the managing board of universities (Rectors and Vice-Rectors). These discussions revealed that currently the universities will not be able to further contribute to the costs of the DK (besides their actual commitments). Also the fact that the FWF currently does not contribute to the overhead costs of large-scale research projects (and thus also not for the DK) needs to be considered here.

Those scenarios that described a situation where the FWF would only provide initial funding or where universities would have to cover an increasing amount of the costs of the DK were rated as inpracticable or even as an illusion given the current tight budget of Austrian universities. Only very few Principal Investigators could image that the funding of the FWF would gradually decline. Summing up the statements of the representatives of universities it can be concluded that most universities already participate to the funding of DK to a large extent (provision of additional funds, additional positions for doctoral students, provision of research infrastructure, reduction of the teaching load for Principal Investigators). In the current situation an additional contribution to the DK was seen as a too big burden for the university's budget.

Conclusion

The evaluation of the FWF DK Programme revealed that it is functioning very well. Researchers as well as the university management evaluate the programme as an excellence scheme. The programme achieved most of its goals (good performance in research, implementation of structural elements in doctoral training, internationalisation etc.). The programme also functions as a stimulus for the further reform and improvement of doctoral training in Austria. Here the programme serves as a role model and plays via funding an important complementary role.

Nonetheless, experiences from other European countries point to an on-going further reform of doctoral training in the recent years. In particular in the Nordic countries (Denmark, Norway and Finland) the training component of doctoral training has become central. Also an increase in the number of doctoral graduates should be achieved in these countries. In line with these targets ministries have been changing the funding mechanism related to doctoral training, also universities have been assigned more responsibility in providing a high quality in (structural) doctoral training. In these countries doctoral training is to a large extent funded by the institutions, mostly by earmarked funds. These changes also led to change in the work of the research councils that had to reorient their funding schemes for doctoral candidates/young researchers.

So far Austria has been using two different but complementary approaches in doctoral training: on the one hand doctoral training is funded by the global budget of the universities, on the other hand additional means (as the FWF DK Programme) are allocated by competitive means. Both funding mechanisms have to be regarded as indispensable and contribute to maintain doctoral training in Austria. For the future the implementation of a unit cost funding model has been included in the intergovernmental agreement. This potential development might also affect the FWF DK Programme, therefore a need to reorient the programme might be considered. Until then the FWF DK Programme should be continued under the premise to fund excellent research and the most talented doctoral students.

1 Introduction

Across Europe doctoral training has significantly changed in the recent years. A multitude of reasons account for this development: the increasing importance of knowledge as a competitive factor in a globalized economy and the increasing demand for highly qualified knowledge workers, the constantly growing number of doctoral students and the increasing efforts of universities to build up and strengthen their research capacities and profiles are also amongst these. Further, more and more higher education institutions become research-intensive and are engaged in a global competition for talent and resources (EUA-CDE, 2013). These developments contributed to a change in the mission statement of doctoral training: doctoral training should nowadays prepare for very different later careers. These developments are also reflected by stakeholders in higher education, for example the League of European Research Universities (LERU) states that “*doctoral graduates make significant contributions to innovation and that they need both a thorough and broad skill set to do so*” (LERU, 2014, p. 3).¹

Growing importance of doctoral training on the European level

Also, on the European level the growing importance of doctoral training is recognized. In June 2011 the European Commission published the *Report of Mapping Exercise on Doctoral Training in Europe* which points out that “*it is important to focus on doctoral training as this is the qualification that should enable researchers to move into a wide range of employment sectors*” (EC, 2011a, p. 1). Doctoral training is seen as a key for the creation of new knowledge and human resources, and thus as a base for building a globally competitive research community and a prosperous society. In line with these assumptions doctoral training has become one of the major priorities in the building of the European Research Area (EC, 2012). Therefore the European Commission also set up a broad range of initiatives that aim to achieve a common understanding of doctoral training among member states, associated countries and higher education institutions across Europe.²

A first step in the development of a common understanding of the principles of doctoral training was the engagement of the European University Association (EUA) (Kottmann, 2012). The EUA started in the framework of the Bologna process an extensive, bottom-up consultation process on the development and improvement of doctoral education and research training in Europe. Based on this consultation involving a number of stakeholders and policy makers from different European countries first conclusions and recommendations were announced as the *Salzburg Principles* in 2005. These included ‘*ten basic principles*’ that should build the basis for doctoral training and stated basic requirements like the research orientation of doctoral training, the recognition of doctoral candidates as professional early stage researchers, the transparency of supervision, the duration of doctoral studies and the need to prepare doctoral candidates for labour markets outside academia.

Altogether the *Salzburg Principles* were set up as a sign of revolution in the doctoral training in Europe, and after some years of gathering experience with new forms of doctoral training the ten principles were enriched and published under the title ‘*Salzburg II Recommendations*’. Then the European Commission conducted a first mapping exercise of practices in doctoral training in 2011 and published further recommendations called ‘*Principles for Innovative Doctoral Training*’ which comprise following issues (EC, 2011):

¹ This demand to prepare doctoral candidates for different pathways inside and outside academia is underpinned by the fact that the majority of doctoral graduates work outside academia in their later professional life. A report of the Royal Society (2010) on doctoral candidates in the UK indicates that only 3.5% of the doctoral graduates hold permanent academic positions, whereas 50% find employment outside academia.

² A follow-up study on the mapping exercise on doctoral training from 2011 was done in 2013. This study looked at the spread of the *Principles for Innovative Doctoral Training* and selected good practices in doctoral training from the participating higher education institutions (EC, 2014).

- *Research Excellence*, research should build the heart of doctoral training and academic standards like peer review procedures and research environments;
- *Attractive Institutional Environment*, including good working conditions and career development opportunities in line with the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers;
- *Interdisciplinary Research Options* offered in an open research environment and culture;
- *Exposure to industry and other relevant employment sectors*;
- *International networking*, as for instance by means of collaborative research and by encouraging mobility through conferences, short research visits or longer stays abroad;
- *Transferable skills training*;
- *Quality Assurance*, enhancing the quality of the research environment as well as promoting transparent procedures for admission, supervision, awarding the doctoral degree and career development.

In line with the implementation of doctoral studies as a third cycle in the study structure of the Bologna process and the provision of guidelines on doctoral training the European Commission invited its Member States to organize doctoral training in a more structured innovative way (EC, 2012). These developments on the European Level but also own initiatives of countries led to a growing awareness of the need to reform doctoral training. Accordingly, a number of European countries have implemented some forms of structural doctoral training in the recent past.³ Besides changes in the legislation also initiatives and the engagement of stakeholders and funders in higher education account for this development on the national level. On the level of universities three main drivers have been identified that contribute to the implementation of innovative forms of doctoral training: *“The recognition that many doctoral graduates seek employment outside the academy and their high-level skills are much sought after; the model of the lone scholar is no longer appropriate, and the heavy reliance on a single PhD supervisor that guides the development of a PhD candidate is not robust.”* (LERU, 2014, p. 5)

Altogether the drivers on the different levels led to an extensive spread of structural doctoral programmes/PhD programmes at European universities. Nowadays, almost every university that is eligible for awarding doctoral degrees has at least one graduate school or has organised its doctoral programmes in a structural way. These programmes aim to bring together bright candidates as these candidates should *“... become creative, critical, autonomous researchers”* (LERU, 2010, p.3) acquiring a broad range of skills like intellectual skills, academic and technical skills, as well as personal and professional management skills. Additionally, to organize doctoral training the majority of universities have implemented organizational frameworks like Graduate or Doctoral Schools. Both Graduate and Doctoral Schools⁴ aim to support innovative, structural doctoral programmes *“...to prepare researchers to the highest level to make important contributions for frontier research”* (LERU, 2010, p. 1).

³ For experiences made in other countries see chapter 6.

⁴ The difference between the two institutional forms of research/doctoral training can be described as follows: Graduate Schools are regarded as institutional framework that is *“... usually organised across the whole of a university to provide strategy, regulation, financial support, generic skills courses, and often admission processes for doctoral education”* (LERU, 2010, p. 6). Doctoral Schools are *“... usually organised along thematic lines across disciplines but focused on specific broad topics. They may bring together researchers in the field from a number of different disciplines. They may also bring together a number of institutions creating stronger critical mass in the field”* (LERU, 2010, p. 6).

Doctoral training in Austria

In the winter term 2013 a total of 27,634 students were enrolled in doctoral studies at Austrian universities, among these 2,046 students (7.4%) were participating in doctoral programmes leading to the title PhD. In the study year 2012/2013 a total of 2,165 students received a doctoral degree, from these about 210 students (9.4%) obtained a PhD degree (BMWF, uni:data).⁵ Unfortunately the data provided by uni:data do not distinguish between different forms of doctoral training, therefore representative data on how many students are currently included in or have graduated from structural forms of doctoral training in Austria are not available to date.

According to Zaussinger et al. (2012) for 27% of all doctoral candidates in Austria doctoral studies are related to their employment; thereof the majority is employed at Austrian universities, these were a total of 7,158 doctoral candidates in 2012. Here the funding programmes of the FWF play an important role as a large number of the so-called '*prae doc*' positions at Austrian universities are funded by its programmes and initiatives. According to the FWF Annual Report in 2013 a total of 1,967 doctoral candidates were funded by means of the FWF.

Also in Austria doctoral training has undergone some changes in the recent years as structural doctoral training became more and more important. As the Universities Act 2002⁶ leaves the organisation of doctoral studies to the universities these have implemented a wide range of initiatives and measures to improve doctoral training like the introduction of curricula for PhD studies, work groups to improve doctoral studies, publication of handbooks on professional doctoral training and the implementation of centres for educational and student services with a special focus on doctoral students.

An important driver for these initiatives to improve doctoral training was the requirement that in the performance contracts between the Federal Ministry of Science and Research and the respective university for the period 2010–2012 the '*Salzburg Principles*' had to be considered. Also the length of doctoral studies was set to a minimum of three years in the law. The different measures, initiatives and activities that have been implemented at Austrian universities to increase the quality of doctoral training can be summarised as follows (BMWF, 2011, p. 92ff):

- Because of the change of the duration of doctoral studies new curricula for doctoral studies had to be established. Most universities took this as an opportunity to strengthen the component of research training in their doctoral training and to implement a stronger internationalization of their doctoral programmes.
- To better steer the progress of doctoral candidates and to achieve a reliable and transparent framework of cooperation for both the supervisor and the doctoral candidate most universities have implemented supervision contracts between the doctoral candidate and the supervisor respectively the university. These contracts mostly regulate the frequency of supervision meetings, the course of study and reports on the progress of the doctoral candidates.
- In the reporting period (2009 – 2011) some Austrian universities have started to establish structural forms of doctoral training at their sites. Here also organisational structures like university-wide or

⁵ Obtaining the title PhD does not reflect the form of training that the doctoral candidate received.

⁶ According to the University Organisation and Studies Act (Universities Act 2002) in Austria only universities are allowed to award doctoral degrees. The law does not prescribe the form of doctoral training, it only stipulates the minimal length of studies and the responsibility for the curricula (überprüfen). According to the Universities Act 2002 students are eligible for doctoral studies when they show the proof of the successful completion of a relevant diploma or master's degree programme. In 2009 criteria for doctoral training such as goal, responsibility for curricula and duration of doctoral studies have been prescribed in an amendment of the Universities Act 2002. Since then the duration of doctoral studies takes a minimum of three years, and universities are free to declare doctoral studies as 'Doctor of Philosophy'-doctoral studies and award the corresponding title 'PhD'.

faculty wide Doctoral Schools have been implemented that aim at a stronger integration of doctoral candidates in the institution and/or the scientific community.⁷

The trend to implement organisational structures for doctoral training at universities is currently still ongoing. According to the performance contracts for the period 2013-2015 some universities plan to implement organisational structures for doctoral training; here the University of Vienna, the University of Graz, the Medical University of Graz, the Graz University of Technology, the University of Innsbruck, the University of Salzburg and finally the University of Klagenfurt have to be mentioned.⁸ Altogether a trend towards more structural forms of doctoral training can be stated for Austria although the majority of doctoral candidates are still trained in the classical master-apprentice model.

Though there have been some initiatives to reform doctoral training some stakeholders in higher education claim that the implementation of structural doctoral training is still at stake in Austria. In a discussion paper the FWF (2010) analyses the extent to which the current practices of doctoral training in Austria are in line with the recommendations of the EC. The main results of this analysis can be summarised as follows (FWF, 2010, p. 23):

- More than half of the doctoral candidates in the survey ask for an improvement of doctoral training in Austria; from all groups and disciplines participating in the research a high demand for innovative or structural forms of doctoral training has been expressed.
- Comparing structural and non-structural forms of doctoral training reveals that structural forms allow a better collaboration between doctoral candidate and supervisor.
- Among the doctoral candidates in the survey a high percentage was planning a later career outside academia. Accordingly, this evidence should be more strongly considered in the agenda of doctoral training.

In line with these findings stakeholders as Universities Austria (uniko), the Austrian Science Board and the Austrian Council for Research and Technology Development have called for an expansion of structural doctoral training in Austria. Economists as Janger (2013) even argued that comprehensive structural doctoral training should become a standard across Austrian universities to increase the attractiveness of academic careers.

The FWF DK Programme

The Austrian Science Fund (FWF) can be defined as a front runner in the reform of doctoral training. Already in 1993 the FWF introduced the funding programme '*Wissenschaftskollegs*'. In fact, in 1994 the first '*Wissenschaftskolleg*' was implemented as integral part of the Graduate Program of the Vienna Biocenter (FWF, 1993).⁹ After several changes and relaunches of the funding scheme for structural doctoral training, in 2004 the current form of the FWF DK Programme has been implemented. Since then the programme has been slightly changed, nonetheless the central goals and key features remained the same. Box 1 below summarizes its goals and key features.

Box 1: FWF DK Programme: goals and features

Key Goals of the FWF DK Programme

The FWF DK Programme aims to establish internationally competitive and renowned training centres for the most talented young researchers. The DK are temporary research units as well as training units for doctoral candidates that are installed at one Austrian

⁷ These organisational structures have for example been established at the University of Vienna and the University of Graz.

⁸ For more information and details see Appendix III.

⁹ The Vienna Biocenter was led by the University of Vienna in cooperation with the Research Institute of Molecular Pathology. For more information regarding the development of the Campus Vienna Biocenter see also Wirth (2013).

university or a cooperation network of (Austrian) universities and/or public research institutes. The most specific characteristic of the DK is that it is established around a common research topic that serves as a framework to steer the cooperation of all participants in the DK and also as an instrument to better integrate the doctoral candidates in scientific research. In addition, the DK provide a study programme that goes beyond study programmes which are offered in other non-DK doctoral programmes.

The programme thus contributes to the reform and improvement of doctoral training in Austria and orients itself to international standards of doctoral training like stated in the Bologna process, the Bergen Communiqué and the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

To establish excellent training conditions for the most talented young researchers for the DK the following instruments are implemented:

- Linking doctoral training to internationally high ranked top research
- Well-established research infrastructure
- Intensive supervision by top-class researchers
- Doctoral training linked to a clear defined research topic/
- Integration of doctoral candidates in collaborative research and the scientific community
- Transferable skills training

Additionally, the DK Programme aims at the strengthening of international cooperation and mobility, interdisciplinary research and supports the establishment of more intensive university-industry collaboration.

Key features of DK

The FWF DK Programme represents a flexible instrument for high-quality, structural training of doctoral students. It is open to all disciplines and can be adjusted to the special needs of the disciplines and host institutions. Central to the DK is the composition of the team of faculty members and the instruments implemented to achieve excellent research training. To become a faculty member academics have to demonstrate a scientific track record as well as teaching experience. The FWF recommends that a minimum of 5 up to a maximum of 20 persons can be involved in the faculty. Each DK has to define a regulatory framework which aims to implement standards and transparent procedures for the following issues:

- Selection of faculty members
- Selection of doctoral students
- Training programme for the doctoral candidates including innovative teaching elements and a supervision concept
- Research programme (interdisciplinary, high scientific quality and originality)
- Thesis assessment

Roles, size and funding of DK

Besides the faculty members the doctoral candidates are the second main actors within a DK. Doctoral candidates can participate as internal doctoral candidates or as associated doctoral candidates in a DK.

Internal doctoral candidates: These doctoral students are funded by means of the FWF DK Programme. These funds cover besides the salary the consumables, travel costs and other expenses like material costs (max. 10,000 Euros per year and doctoral candidate). Also the costs for training are funded by a maximum of 5,000 Euros per doctoral candidate and year. The number of internal doctoral candidates is dependent on the number of faculty members as each faculty member can receive funding for one internal doctoral candidate, i.e. between five and 20 internal doctoral candidates can participate in a DK.

Associated doctoral candidates: Besides the internal candidates also doctoral candidates who are funded by other than the FWF means (e.g stand-alone projects funded by the FWF, special research programs, EU projects, university programmes or related priority research areas) can participate in a DK. The FWF Programme provides up to 5,000 Euros per year and student to cover training costs. According to the guidelines of the FWF up to 40 associated doctoral candidates can participate in a DK, i.e. per faculty member two associated doctoral candidates are allowed.

As regards rights and eligibilities the DK does not differ between the internal and associated students. Both groups have the right to fully participate in the training and the research programme.

Further, the DK Programme also funds the full costs for administrative support of a DK. In general, one position for a higher education graduate who coordinates the activities of the DK is funded.

DK can be funded for a period of 12 years at maximum. In total DK can apply for three funding periods of four years each. After each funding period the DK are evaluated in an international peer review. The continuation of the DK is dependent on the positive evaluation of its proposal for the upcoming funding period and its achievements in the foregoing funding period in an international peer review.

Research programme and training

As the DK programme aims at improving and implementing international standards into doctoral training in Austria as well as funding internationally competitive research DK have to set up a training programme as well as a research programme. For the training programme the planned course and the supervision concept need to be described, additionally it has to be demonstrated that the offered programme goes beyond the curricula of other doctoral programmes. The research programme needs to be interdisciplinary and should demonstrate high scientific quality and originality at an international level.

Selection of DK

The selection of DK for funding is organized in a two stage process. In the first stage applicants have to submit a concept proposal of their planned DK. This concept proposal is reviewed by the FWF. Applicants whose concept proposal has been reviewed positively in the first round are asked to submit a full proposal. These full proposals are assessed in an international peer review organized by the FWF. Within the peer review a number of criteria are used, among these the profile of the DK and of the faculty members, the DK's research programme and the training programme are most important. Also, the decision about the continuation of a DK is based on an international peer review. In this review besides the proposal also the DK's performance and the commitment of the host university are evaluated. For those DK that will be funded for the maximum period of 12 years the FWF plans to eventually evaluate their overall performance.

Source: Tender 'Evaluation of FWF Doctoral Programmes (DK Programme)', February 2013, adopted by IHS – CHEPS – AIT.

Status quo

The FWF Doctoral Programme plays a special role in the Austrian landscape of doctoral training. It is dedicated to train the most talented doctoral candidates and contribute to the further development of top-research in Austria.

In order to achieve these aims Doktoratskollegs (DK) are established at universities where research programmes of high scientific quality and originality at an international level are implemented. In collaboration with and supported/supervised by excellent scientists, the doctoral candidates strengthen their field of knowledge and therefore train specific and methodological research competencies. Also courses offering trainings in generic and transferable skills take place. Additionally, the Doctoral Programme aims to support the implementation of high quality doctoral training at Austrian universities in general.¹⁰ Thus, one of the expected effects is to have an impact on further, on-going reforms of structured doctoral training in Austria.

Categorising these goals makes clear that the FWF Doctoral Programme has manifold missions. On the one hand it funds the implementation of high quality doctoral training for talented young researchers. Also the funding of top-research is on the agenda of the programme. On the other hand the funding programme also follows a policy mission as it aims to support the implementation of high quality education that aligns with European standards.

¹⁰ According to the FWF DK Programme guidelines one aim is: „Unterstützung einer hochqualitativen Doktorandenausbildung an den Universitäten im Allgemeinen, nach den internationalen Standards einer PhD-Ausbildung entsprechend den Vorgaben von Bologna-Prozess und Bergen Communiqué sowie den Grundsätzen der European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers“ (FWF, n.d., p. 3).

2 Aims of the study, its analytical framework and methodology

This study is an evaluation of the FWF DK Programme. It is carried out by an international consortium that consists of the Institute of Advanced Studies (IHS), the Center for Higher Education Policy Studies (CHEPS) and the Austrian Institute of Technology (AIT).

In the following the aims of the study, the analytical framework and the main research questions will be addressed. Also the structure of the study as well as the methodology and data sources will be presented.

Aims of the study

To date the FWF DK Programme has not been evaluated. Therefore this evaluation aims to present the main characteristics of the programme; in particular the implementation of the FWF DK Programme and its significance for doctoral training in Austria.

As regards the implementation we will analyse practices and policies of Doktoratskollegs (DK). A major aim is to identify good practices in doctoral training. For this purpose we will investigate whether the implemented DK are able to achieve the goals of the programme. Here also context factors like institutional characteristics and disciplinary peculiarities will be taken into account. As the study is mainly interested in the lessons learned, we will also investigate whether the DK have contributed to the professionalization of doctoral training; i.e. we will discuss to what extent the practices of DK reflect the *Principles for Innovative Doctoral Training* referred to above.¹¹

As regards the significance of the Doktoratskollegs we will gather perspectives of different stakeholders of the FWF DK Programme like Principal Investigators and Coordinators, representatives of universities and ministries etc. We will present how motives and aims of the DK, operation patterns and the embeddedness of DK are perceived and evaluated by these stakeholders. We will also present an overview of recent initiatives of Austrian universities to reform and innovate doctoral training at their institutions. In this respect the question whether the FWF DK Programme has significantly contributed to a change of doctoral training at Austrian universities. Further, we will discuss the added value of DK compared to the universities' activities and initiatives.

In an international comparison the achievements and operation patterns of the FWF DK Programme will be reflected in the light of similar funding programmes or national reforms of doctoral training in selected European Countries.

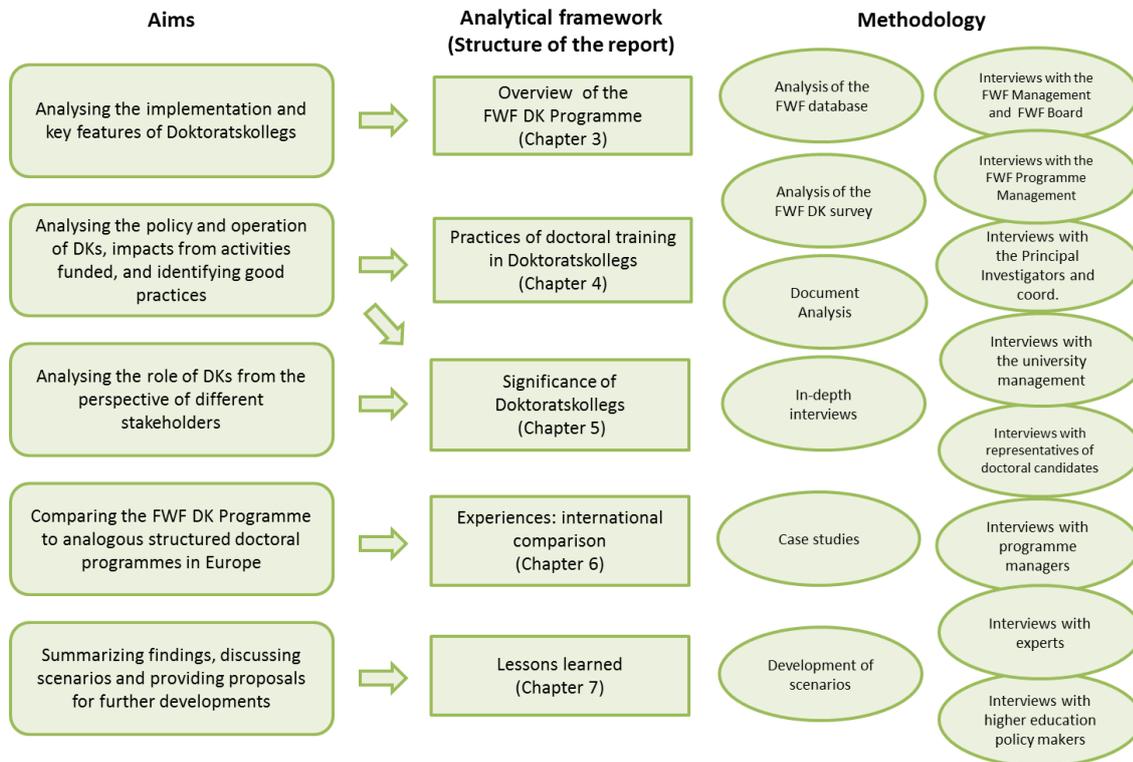
Finally, we will summarize the findings as '*lessons learned*' and conclude recommendations that maintain proposals for the fine tuning in the current implementation of the programme as well as the future development of the FWF DK Programme. The latter will be based on a discussion of scenarios that focus on the funding of doctoral training. Lastly feasible ways for the improvement of the FWF DK Programme and ways to tackle current challenges will be described.

¹¹ For more information on the *Principles for Innovative Doctoral Training* see EC (2011).

Structure of the report

The study is based on an analytical framework and methodology as shown in figure 1 below. Also the structure of the report can be derived from the figure.

Figure 1: Aims, analytical framework and methodology



Source: IHS – CHEPS - AIT

Chapter 3 takes stock and gives an **overview of key figures** of the FWF DK Programme. In this chapter the following questions will be addressed:

- How many DK have been funded since the implementation of the DK Programme? How did the number of applications and approvals develop?
- Which DK have been selected for funding? What are the DK's features regarding size, location, discipline and cooperation among DK/higher education institutions?

Chapter 4 provides an analysis of the **practices of doctoral training in DK**. Here the following questions will be discussed:

- Have DK developed good practices for innovative doctoral training? What policies and instruments have been implemented for the selection and supervision of doctoral candidates, for the training programme and internationalisation of the DK?
- Did these policies and instruments help the DK to achieve
 - o a stronger professionalization of doctoral training as well as a
 - o a change in the culture of doctoral training?

- Do the DK orient their policies and instruments to current challenges and developments in the ongoing reform of doctoral training? Do DK pick up – implicitly or explicitly – the recent developments on the European level, in particular the *Principles for Innovative Doctoral Training*?

Chapter 5 investigates the **significance of the Doktoratskollegs** for the reform and innovation of doctoral training in Austria by analysing the perspectives of stakeholders. Here the Principal Investigators have been invited to reflect on the *motives, aims and assets* regarding the DK. For this purpose the following questions are addressed:

- What is the motivation of Principal Investigators to apply for a DK?
- What aims do Principal Investigators define for their DK?
- What are assets and drivers to establish a DK for Principal Investigators?

Besides these aspects also a number of aspects related to the *programme management and its administration* and the *review and evaluation procedures* will be analysed. Thus, we will address questions as:

- Are the programme guidelines easy to comprehend for potential applicants? Has the regulatory framework of the DK Programme been well understood by current Principal Investigators?
- How is the support by the FWF programme management perceived and evaluated?
- Are the application and review procedures transparent and well organised – is there any need for improvement?
- Do the application and review procedures also ensure high quality?

According to the programme guidelines DK aim to improve standards in doctoral training. In this respect the *performance and operation patterns of DK will be investigated*. To achieve a comprehensive picture of the overall functioning of DK perspectives from different actors involved in the establishment of a DK have been integrated in the research, among these were besides the Principal Investigators also Coordinators of DK and representatives of doctoral candidates.

Here Principal Investigators and Coordinators of DK have been asked the following questions:

- Does the DK Programme offer flexibility as regards disciplinary and institutional peculiarities?
- What are the aims and assets of the innovative doctoral training in DK (structured curriculum with innovative training elements, interdisciplinary approach, critical mass, high-level research, access to infrastructure, faculty team, international cooperation etc.)?
- Do the guidelines of the FWF DK Programme allow the achievement of these aims? Are there issues for improvement?
- Are ‘internal’ and ‘associated’ doctoral candidates treated differently?
- What competencies (scientific, interdisciplinary, management, team competencies etc.) do doctoral candidates develop in DK?
- What happens after graduation? Does the FWF DK Programme train internationally employable PhDs?
- Has gender equality at the level of faculty as well as the level of doctoral candidates been achieved?

In order to gain insight in the functioning of a DK from the perspective of the doctoral candidates we will address their representatives with the following questions:

- How attractive are DK for PhD students? What are the assets for doing the PhD in a DK?
- Are there any differences between ‘internal’ doctoral candidates and ‘associated’ doctoral candidates? Is one of these roles more favourable?

- What are the current problems/challenges that doctoral students have to deal with in general but also in relation to the DK?

In order to investigate the significance of the DK we will look at their *embeddedness* in the teaching and research of the host universities. For this purpose we will focus on the following questions:

- Are DK also open for non-DK doctoral candidates?
- Have DK been established in research fields that are enhanced by the host university's strategy? In this respect, are DK established in cooperation with large-scale research programmes or other projects/initiatives/programmes at the university?
- Do DK build up critical mass in a specific research area? Further, do DK contribute to the research profile of universities, their visibility as well as their overall attractiveness?

To investigate the significance of DK we will also discuss their role for initiatives for reforms in doctoral training that have been implemented by Austrian universities in the recent past. Here will investigate the perspectives of the university management represented by Rectors, Vice Rectors for Research and Directors of Doctoral Studies on the significance of DK for the strategic planning of the university. Here we will focus on the following questions:

- Considering the university's own initiatives in doctoral training, what role does the FWF DK play? Do the FWF DK have an impact on the initiatives in the reform of doctoral training of the university? Which experiences were/are used to enhance professional, structured doctoral training in form of PhD programmes, doctoral schools etc.?
- What is the university's commitment to implement DK, how do universities support the establishment of DK?
- What are the universities management's plans for the DK when its last funding period has been completed? How does the university management want deal with the eventual case that a DK might not be prolonged because it fails in the international peer review? How does the university management address the sustainability of a DK – are there plans to integrate the DK into the university's programme portfolio? Are universities prepared to fund the continuation of the DK by means of their global budget or by other means?

Finally, we will summarize all the findings on the different perspectives of stakeholders and depict the added value of Doktoratskollegs for researchers, students and universities.

In chapter 6 we will investigate **experiences** with structural doctoral training programmes made in other European countries. Here we will analyze doctoral programmes funded by national research councils such as the Graduate Programme of the Netherlands Organisation of Scientific Research (NWO), the Research Training Groups of the German Research Foundation (DFG), the Graduate Schools of the Academy of Finland, the Pro-Doc-Programme that has been managed by the Rectors' Conference of Swiss Universities, and the National Research Schools of the Research Council of Norway, also doctoral training in Denmark will be under review. All these funding programmes have in common that they have implemented to some extent similar instruments for doctoral training like the FWF DK Programme. Thus, the international comparison aims to map where the FWF DK Programme currently stands in the European landscape of doctoral funding and training. For this purpose, we will particularly address questions as:

- Concerning the implementation, what is the specificity of the FWF DK Programme? In what respect does it differ from the other funding programmes?

- Compared to the other funding programmes where is the FWF DK Programme positioned regards its activities and achievements?
- Analysing the significance of the funding programmes, to what extent do the funding programmes contribute to the reform of doctoral training in the national higher education systems under review?

Finally, in chapter 7 we will draw on the results of the international comparison and the other analyses to identify **the lessons learned** so far. From these recommendations for the improvement of the implementation and the significance of the FWF DK Programme will be concluded. Also, proposals and scenarios for the further development of the FWF DK Programme will be developed and discussed. We therefore aim to identify ways to continue DK as a form of innovative doctoral training at Austrian universities where the universities take more responsibility. In this context we will again consider perspectives from different stakeholders, including the perspectives of higher education stakeholders on the national level.

Data and Methods

The study is carried out as evaluation research that addresses ‘classical’ evaluation issues, i.e. the design, implementation, practice and policy, performance and impact of the FWF DK Programme. Therefore the programme has been analyzed from the perspectives of the different stakeholders as regards its overall performance, functioning and impact.

To address the different perspectives and the complex setting in that the FWF DK Programme has to operate the study has been based on a mix of qualitative and quantitative methods. For the research data from the FWF database (provided by the FWF programme management) and from in-depth interviews with the stakeholders of the FWF DK Programme have been used.

In the following the different data sources and databases will be described shortly. Additionally, at the beginning of each chapter the data and methods that have been used will be mentioned.

Analysis of the FWF database

To gain a first insight in the scope and key figures of the FWF DK Programme, data from the FWF database on the DK covering the number of concept proposals, full proposals decided and approved, funding periods and funding volume, disciplines and host institutions have been analyzed. The data have been provided by the FWF programme management. In the analysis all project proposals and funding details since 2004 have been included.

Analysis of the FWF DK survey

In autumn 2013 the FWF Programme Management conducted a survey among all ongoing DK. Here data on the number of internal and associated students, gender, country of origin, status of students differing between on-going and graduated and date of promotion were collected. In total 34 DK have been surveyed.

Document analysis

A document analysis of the project proposals and evaluation reports of 15 selected DK was done. In this analysis the documents of all DK have passed at least one interim evaluation have been integrated. The analysis putting the focus on the policies and practices of DK was supported by the software MAXQDA, a software that enables to organize and categorize data, code and retrieve information.

In-depth interviews

In-depth interviews have been used to gather more detailed information on the functioning and significance of the Doktorskollegs. With the interviews as many information as possible about key features, policies and practices and contexts of DK have been collected. These data have been used to investigate the significance of

the DK; they also build a solid basis for the conclusions and recommendations. In total more than 40 face-to-face and telephone interviews were done. In the interview a wide range of stakeholders (e.g. the former FWF President, the Managing Director of the FWF, representatives of the FWF Board, FWF Programme Managers, Principal Investigators and Coordinators of DK, representatives of the national association of doctoral candidates and representatives of centres for doctoral studies at Austrian universities, Rectors and Vice Rectors, Directors of Doctoral Studies, higher education policy makers, and experts) has been participating. A detailed list of interviewees and the interview guidelines are attached in appendix I and II.

Case studies

The international comparison is based on a document analysis that has been expanded by expert interviews with representatives from funding organisations, research councils and other stakeholders in doctoral training in the selected European countries. Geographically, the focus of the international comparison is on Europe, here countries that are culturally similar to Austria and are regarded as front runners in innovation and sustainable growth have been selected. Here also the list of interviewees is attached in appendix II.

Development of scenarios

The development of scenarios is a qualitative approach, actually a creative procedure in order to develop ideas, options for further ways of implementing the FWF DK Programme. The scenarios were developed together with the FWF Programme Management and discussed with stakeholders as the Principal Investigators of the DK and the management of universities hosting a DK.

3 Overview of the FWF DK Programme

The aim of this chapter is to give an overview of the FWF DK Programme over time focusing on the development of applications, approval rates, and distribution over scientific disciplines and host institutions. Additionally this chapter will investigate some internal aspects of the DK. Key figures on the composition of the student body as regards internal and associate candidates, the gender distribution and the participation of international students will be presented. Also, some aspects of the performance of the DK Programme like the graduation rate and the time to degree will be presented.

Methodology

The following analyses are based on three sources: the FWF project database, the FWF survey among DK and the document analysis of the full proposals and evaluation reports of 15 selected DK.

FWF project database

The FWF project database contains information on the FWF DK Programme as regards the Principal Investigators, doctoral candidates, the budget, collaborating institutions, scientific disciplines involved, and funding periods (including start and end dates). This information was provided by the FWF Programme Management. In fact, information from the FWF project database is available for 37 DK that have already been established from 2004 onwards plus for five DK that have recently been approved in December 2013 and will start in the near future.¹²

FWF DK survey

In autumn 2013 the FWF programme management conducted a survey among all 34 DK that have been funded at that time. Within the survey the DK were asked to provide data on following issues:

- Number of internal and associated doctoral candidates
- Gender of the doctoral candidates
- Current status of the doctoral candidates, i.e. if they have been dropping out, graduating or if they are still studying
- Time to degree for the doctoral candidates who have been graduating
- Country of origin of the doctoral candidates

In total all 34 DK returned the questionnaire. Although all DK were approached with the same template there are some differences in the data provided. While most of the DK were able to deliver exact information on internal candidates this information was often lacking for the associated doctoral candidates.¹³ In particular information on the time-to-degree of associated students and status changes of students was hardly available.

Document analysis

The document analysis includes full proposals and evaluation reports of 15 selected DK. To build the sample those DK have been selected for the in-depth analysis where at least one evaluation report is available. Most of the DK (8 out of 15) under review are established in the Life Sciences, four DK are located in the Natural and Technical Sciences and three DK in the Humanities and Social Sciences. The selected DK also represent different

¹² Recently the FWF announced that there will be no call for applications for the DK Programme in 2014 because of uncertainties of the future development of the FWF budget (see <http://www.fwf.ac.at/de/projects/ausschreibunguebersicht.html>).

¹³ Some Principal Investigators did not deliver more information they were asked for because of confidentiality reasons.

funding periods. From the 15 selected DK two DK are already in the 4th funding period (from them three evaluation reports are available). Five DK are in the 3rd funding period and have two evaluation reports; finally eight DK have already moved to their 2nd funding period and provide one evaluation report. The table below gives an overview of central characteristics of the DK in the sample. For some of the aspects investigated not all DK have provided data in their evaluation reports. Therefore some tables will indicate a lower number of cases.

Table 1: Characteristics of the sample (number, percent)

	Number	Per cent of the sample
Total number of DK in the sample	15	100%
Discipline		
Life Sciences	8	54%
Natural and Technical Sciences	4	26%
Humanities and Social Sciences	3	20%
Current funding period		
second funding period	8	54%
third funding period	5	33%
fourth funding period	2	13%
Cooperation		
no cooperation	3	20%
cooperation with other HEI or research institutes	12	80%
Faculty members		
less than 10	9	60%
more than 10	6	40%
Percent of female faculty members in the first funding period		
no females	7	47%
less than 30%	7	47%
more than 30%	1	6%
Total number of students		
less than 20 students	2	13%
less than 50 students	11	73%
less than 100 students	1	7%
more than 100 students	1	7%
Percentage of associated students		
less than 25%	3	20%
25-50%	7	47%
more than 50%	5	33%

Source: Document analysis

In total the sample represents 145 faculty members and 562 doctoral candidates. From the doctoral candidates 298 were internal DK candidates and 264 associated DK candidates.

In the remainder of this chapter it will be indicated which data source has been used for each analysis.

3.1 The FWF DK Programme at a Glance

3.1.1 Development of the FWF DK Programme

As the FWF DK Programme was introduced in 2004¹⁴ the FWF decided to fund in total 42 DK with a budget approved for the period 2004–2013 of 130.6 million Euros. Hence, the approval rate of full proposals from concept proposals is at 31% on the project level and 24% on the funded budget level. The following table 2 summarises data on the scope, number of applications and application success rate of the FWF DK Programme for the period 2004-2013.

Table 2: Overview of the FWF DK Programme (2004-2013)

	Number, percent	Budget in mio. EUR, percent
Concept proposals decided	136	303.7
Concept proposals approved	57	115.9
<i>Approval rate concept proposals (Concept proposals decided/Concept proposals approved)</i>	42%	38%
Full proposals decided ¹	59	129.1
Full proposals approved	42	72.6
<i>Approval rate full proposal from concept proposals (Full proposals approved/Concept proposals decided)</i>	31%	24%
<i>Approval rate full proposals (Full proposals approved/Full proposals decided)</i>	71%	56%
Proposals for 2 nd funding period decided	22	54.5
Proposals for 2 nd funding period approved	16	30.0
<i>Approval rate 2nd funding period (2nd Funding proposals approved/2nd Funding proposals decided)</i>	73%	55%
Proposals for 3 rd funding period decided	10	26.3
Proposals for 3 rd funding period approved	10	21.7
<i>Approval rate 3rd funding period (3rd Funding proposal approved/3rd Funding proposals decided)</i>	100%	82%
Proposals for 4 th funding period	2	6.8
Proposals for 4 th funding period approved	2	6.3
Approval rate 4 th funding period	100%	93%

¹ Including two proposals that were handed in as 'fast track' proposals. Here consortia that have been handing in excellent research proposals but failed in the concept proposal stage because of formal reasons or because of deficits in the training programme were allowed to hand in improved full proposals for the full proposal stage. To date, the FWF does not allow fast track proposals anymore, as mostly the full proposals have not been improved substantially by the research groups.

Source: FWF project database

The selection of the FWF DK is organized in a two-step procedure. In a first step applicants have to send in a concept proposal for their planned DK. From those the most promising sketches are selected and applicants are asked to send in a full proposal. From these full proposals the DK to be funded are finally selected. In the selection of both, concept proposals and full proposals, international peer review is involved.

¹⁴ Before 2004 three so called 'Wissenschaftskollegs' were funded by the FWF which already carried the idea of the DK. However, the following evaluation study only focuses on the FWF DK Programme since 2004.

In the period 2004-2013 a total of 136 concept proposals were submitted, from these 57 proposals were approved for sending in a full proposal (42% approval rate in the first selection). Out of the 59 full proposals decided (57 concept proposals approved plus two ‘fast track’ proposals) 42 DK were selected for a first funding period; these were 71% of the full proposals and 31% of the concept proposals. For the second funding period a total of 22 proposals were decided, out of these 16 were approved, implying an approval rate for the second funding period of 73%. Finally, for the third and fourth funding periods all decided proposals have been approved so far.

This high selectivity of the programme is also reflected in the numbers on the allocated budget. There is a considerable difference comparing the budget applied for by the concept proposals decided (303.7 million Euros) and the budget allocated to the full proposals approved (72.6 million Euros) for the first funding period; here the approval rate for the budget is 24%. Looking at the follow-up periods, the approval rate for the budget of DK increases; it rises from 55% for the second funding period to 82% for the third and 93% for the fourth funding period. The selection procedure can therefore be evaluated as being sensitive to research excellence as well as the efficient use of scarce resources.

To demonstrate the development of the number of DK approvals, table 3 illustrates how many DK were approved per year in the period 2004 till 2013. The table summarises all approvals for the first funding period as well as for all the follow-up funding periods and differs by discipline.

Table 3: Number of approved proposals (2004–2013)

Year	Number of approved proposals							Total # of approved proposals
	for 1 st funding period	for 2 nd funding period	for 3 rd funding period	for 4 th funding period	from LS	from NaTec	from SSH	
2004	2				1		1	2
2005	3				1	2		3
2006	8				4	3	1	8
2007	2				1	1		2
2008	3	4			4	2	1	7
2009	8	2			4	2	4	10
2010	5	4	1		5	2	3	10
2011	4	2	3		5	4		9
2012	2		2		2	1	1	4
2013	5	4	4	2	7	4	4	15
Total	42	16	10	2	34	21	15	70

Source: FWF project database

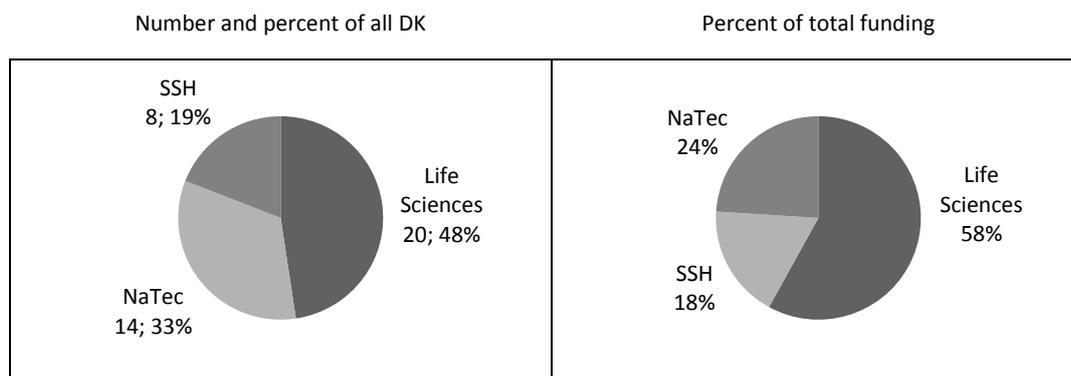
The data demonstrate that the number of approved proposals for the first funding period reached a peak in 2006 and 2009. Recently, in 2013 five proposals were approved. Looking at the follow-up proposals for the FWF DK Programme already table 2 shows that most of them were approved. Two of the DK got already approved for a fourth funding period.

All in all the data on approvals demonstrate that the DK Programme is highly selective at the entrance port as the success rate of first proposals is quite low. As the success rate for follow-up proposals is relatively high it can be argued that the selection at the first port is working properly – apparently, the peer reviews confirm that the majority of DK is able to meet the goals of the FWF DK Programme.

3.1.2 Doktoratskollegs by scientific discipline

Nearly half of all FWF DK are established in the Life Sciences; in fact 20 of 42 FWF DK (47%) are funded in this discipline. Furthermore eight of the FWF DK (19%) are in the Social Sciences and Humanities, and 14 FWF DK (33%) are in the Natural and Technical Sciences.

Figure 2: DK by discipline (2004-2013)



Source: FWF project database

In terms of funding, the distribution is to some extent different and mainly depends on the costs of research done in the respective DK; i.e. the funding volume is determined by the discipline, the size (the number of faculty members) and the current funding period of the DK. As figure 2 shows the biggest share of the total funding has been spent on DK in the Life Sciences (58%). Here it also has to be considered that some of the Life Sciences DK are already running in the 4th funding period. Nearly one quarter of the total funding (24%) has been spent on DK in the Natural and Technical Sciences and about 18% on DK in the disciplines of Social Sciences and Humanities.

3.1.3 Doktoratskollegs by host institutions

From the 22 public Austrian universities 13 have already established or are currently going to establish at least one FWF DK.¹⁵ Apparently, Austria's largest university – the University of Vienna – is most successful as it has already hosted nine DK (currently seven DK are on-going) as main institution and has received over 28.5 million Euros (about 21% of the total budget of the DK Programme) between 2004 and 2013. Then the Medical University of Vienna, the Technical University of Vienna and the University of Graz follow as each of them has set up five DK with a percentage ranging from 10% to 17% of the total budget.

Table 4: Number of DK and percentage of the total budget per host university (2004–2013)

Host university	Number of DK	% of all DK	Budget in EUR	% of total budget
University of Vienna	9	21%	28.501.568	21%
Medical University of Vienna	5	12%	23.222.741	17%
Technical University of Vienna	5	12%	13.223.019	10%
University of Graz	5	12%	21.492.249	16%
Technical University of Graz	4	10%	6.551.056	5%

¹⁵ According to the 'one location principle' of the FWF DK Programme these universities represent the host institutions of DK. Also the Principal Investigators are affiliated at these host universities.

Medical University of Innsbruck	3	7%	13.877.607	10%
Paris-Lodron-University Salzburg	3	7%	6.179.253	5%
Medical University of Graz	2	5%	9.250.797	7%
University of Linz	2	5%	4.265.410	3%
University of Natural Resources and Life Sciences Vienna	1	2%	2.676.662	2%
University of Innsbruck	1	2%	2.038.503	2%
University of Veterinary Medicine Vienna	1	2%	2.405.037	2%
Vienna University of Economics and Business	1	2%	1.270.079	1%

Source: FWF project database

In order to establish and run DK, in some cases host institutions cooperate with other universities and public research institutions (co-applicants). In fact, in 11 DK two or more universities are collaborating to run a DK, also partnerships between universities and the Austrian Academy of Sciences (four DK) and applied research organisations can be found (two DK). In doing so the co-applicants belong to the following institutions:

- Austrian Academy of Sciences
- Ce-M-M-Research Center for Molecular Medicine
- Johann Radon Institute for Computational and Applied Mathematics (RICAM)
- IMBA - Institute of Molecular Biotechnology GmbH
- Gregor Mendel Institute (GMI)
- Montanuniversitaet Leoben
- University Hospital Salzburg
- IMP - Research Institute of Molecular Pathology
- Technical University Munich

Among these cooperation partners the Technical University of Munich is apparently the only international partner in the role of a co-applicant. However, this is regarded as an exceptional case as the funding follows the regulative framework of DACH¹⁶; i.e. in this particular case the DK is funded by the Austrian Science Fund and the German Research Foundation.

¹⁶ DACH is a trilateral agreement between the German Research Foundation (DFG), the Austrian Science Fund (FWF) and the Swiss National Science Foundation (SNF) that aims to support the Lead Agency process. The Lead Agency process targets researchers in Germany, Austria and Switzerland that wish to conduct a cross-border research project. According to that the Lead Agency process is devised to simplify the evaluation of cross-border applications.

3.2 Key figures on DK members, DK performance and institutional support of DK

3.2.1 Key figures on DK members

Faculty members

Faculty members build the basis of the DK as they are expected to develop a DK according to the programme goals. Together with the Principal Investigator who serves as main applicant and speaker the faculty members build the heart of the DK. To become a faculty member researchers have to demonstrate scientific excellence and experience in the training and supervision of doctoral candidates. Within the DK the faculty members are responsible for a research project or a research area. Here they overtake the supervision of one internal doctoral candidate and where possible of another one or two associated doctoral candidates.

The scientific excellence and the experience of the faculty members are an important asset in the evaluation of DK. The analysis of the full proposals and the evaluation reports reveals that the selection of faculty members is an important process in the DK. Mostly a similar set of selection criteria has been implemented in the DK. In the full proposal most of the DK mention the following criteria:

- Commitment of the faculty member to the DK programme goals
- Representation of a research area that is complementary to the already existing research in the DK
- Excellence in original research indicated by publications and funding records
- Leadership functions in on-going research, academic and university activities
- Engagement in graduate student teaching, supervision and development
- Formal requirements of universities for being eligible for the supervision of PhD students¹⁷

In most DK the number of faculty members has grown when moving from one funding period to the next. In the first funding period the number of faculty members ranges from 5 up to 15 persons. On average the Life Sciences DK had more faculty members (11 members) than DK in the Social Sciences and Humanities (10 members) and in the Natural and Technical Sciences (7 members). Overall, the increase in the number of faculty members was between 5% and 50% when moving to the next funding period. The increase in the number of faculty was strongest when moving to the second funding period; this may imply that the expansion of a DK mostly happens in the second funding period.

When increasing the number of faculty members special emphasis is put on increasing the share of female faculty members. This is also strongly supported by a general FWF principle which recommends that at least about 30% of the faculty members should be female. Up to now, only one of the 15 DK analysed has more than 30% females among faculty members. However, it is evident that nearly half of the DK did not involve female faculty members in their first funding period. Most of the DK without female faculty argue that there are only limited opportunities to include females as these are hardly present at their faculties.

As regards supervision experiences of faculty members we find two major approaches among the DK. While some DK explicitly mention that faculty members need experience in supervising students or publishing with doctoral candidates, other DK recruit young researchers who are less experienced in supervision. In particular DK in the Life Sciences include young researchers who have just started their academic career in their faculty.

¹⁷ In Austria this right is usually granted upon the completion of the Habilitation. However, the guidelines of the FWF do not specify any regulation as regards the formal eligibility of the faculty members for the supervision of doctoral candidates. Most important here is the scientific excellence of the respective faculty member.

These DK often argue that the DK provides a good opportunity to learn how to do excellent doctoral training for young researchers. Some DK also indicate that a mixed faculty represents a useful and balanced blend of youth and experience. In order to support also young researchers it is seen as a chance that criteria for the selection of young researchers are often adjusted to their career stage.

Doctoral candidates

The FWF DK survey reveals that from 2004 till 2013 in total 1,121 doctoral candidates have been integrated in the 34 DK that are currently established at Austrian universities. As table 5 demonstrates from the 1,121 doctoral candidates about 49% were internal and 42% were associated doctoral candidates.¹⁸ For the remaining 9% of the doctoral candidates the DK indicate that those have had both statuses; i.e. they were internal as well as associated doctoral candidates.¹⁹ Furthermore, the results reveal that in the period 2004-2013 a total of 302 doctoral candidates (27%) graduated, whereas 756 doctoral candidates still have the status of 'on-going'.

Table 5: Key figures on doctoral candidates in DK (2004-2013)

	Total number	Share in %
Doctoral candidates	1,121	100%
Internal doctoral candidates	550	49%
Associated doctoral candidates	473	42%
Doctoral candidates graduated	302	27%
Doctoral candidates on-going	756	67%
Drop out	53	5%
Female doctoral candidates	511	46%
Male doctoral candidates	610	54%
International doctoral candidates	639	57%
Doctoral candidates in Life Sciences	629	56%
Doctoral candidates in NaTec	324	29%
Doctoral candidates in HSS	168	15%

Source: FWF DK survey 2013

¹⁸ The status of 'associated candidates' was introduced with the revision of the DK Programme in 2007. Faculty members are allowed to associate doctoral students to the DK. The FWF opened the option for faculty to commit grant money from other sources to 'associated' DK positions. The associated candidates should enjoy the same benefits as the internals. In this strategy the faculty provides the salary and a budget for consumables, the FWF finances all additional recruitment, training and mobility costs associated with the DK Programme with a fixum of 5,000 Euros for each associated candidate. Generally, each of the faculty members is allowed to integrate up to two associated doctoral candidates in the DK.

¹⁹ There are different patterns of having both status: In some of the DK the doctoral candidates switch between the two status (e.g. becoming an associated student when working for a different project or going abroad on other sources than the FWF funds); in other DK internal doctoral candidates have become associated when their official term of employment in the DK was finished but the doctoral study was not completed so far.

Analysing the key figures on doctoral candidates per DK and by discipline from 2004 to 2013, table 6 demonstrates that on average about 33 doctoral candidates were participating in a DK.²⁰ The differences between the DK as regards student numbers are quite high as the average number of candidates ranges from 11 to 115. These differences are mostly determined by the number of faculty members participating in a DK. Also the percentage of associated candidates shows that the DK have been mixing their student population differently. While in most of the DK about 30 to 40% were associated, a few DK only had internal candidates. Apparently, the majority of all doctoral candidates have been studying in Life Sciences DK; within these also the average percentage of internals was highest at 58%.

On average 46% of the doctoral candidates are female students. As table 6 demonstrates the average percentage of women is lowest in the Natural and Technical Sciences, and highest in the DK in the Life Sciences. This implies that DK are able to achieve a gender balance among doctoral candidates. Comparing these findings with the overall gender balance among doctoral candidates in Austria (BMWF uni:data) shows that in the DK a similar gender balance has been achieved. Among all doctoral students about 46.6% were female in the winter term 2013.²¹

The DK are also very strong in integrating international students. With an average of 57% international students they exceed the percentage of international doctoral candidates in Austria by far (26.8% in the winter term 2013, BMWF uni:data).

Table 6: Key figures on doctoral candidates per DK and by discipline (2004-2013)

	Average number of doctoral candidates per DK	Average % of internal doctoral candidates per DK	Average % of associated doctoral candidates per DK	Average number of graduates per DK	Average number of drop outs per DK	Average % of female doctoral candidates per DK	Average % of international doctoral candidates per DK
Life Sciences	37	58%	42%	10.1	2.3	60%	59%
NaTec	32	43%	57%	9.9	0.2	25%	53%
SSH	24	54%	46%	4.3	1.6	44%	60%
Total	33	53%	47%	8.9	1.6	46%	57%

Source: FWF DK survey 2013

A further indicator showing how well DK are performing is the number of doctoral candidates who have successfully completed their PhD study within the time funded by the FWF DK. Here the DK reported that in total 302 doctoral candidates have successfully completed their PhD study and hold a degree; these are 27% of all doctoral candidates funded by the DK Programme.²² Given the DK only report on the events that occurred while the doctoral candidates were DK members they might lack information on whether the candidates have been completing their degree while not being a DK member anymore. Also we have to consider that a total number of 756 doctoral candidates still have the status of ‘on-going’.

²⁰ Here it also has to be considered that some of the DK have already been in their third or fourth funding period.

²¹ Unfortunately the BMWF uni:data does not indicate the gender ratio for the different disciplines.

²² Just to put this number in relation we want to note that in 2012/13 a total number of 2,165 students finished their doctoral study and were awarded a degree (BMWF uni:data).

Concerning the drop out in the FWF DK Programme – there was no definition in the questionnaire sent to the Principal Investigators used – the overall dropout rate is rather low. Indeed, the data of the FWF DK survey reveals that the drop out is just 5% defined as having stopped the PhD study. But it is also evident that the dropout rate varies; based on the survey data it ranges from 0% in some DK to 24% in one singular DK. We also find that the dropout rate is generally lower in the Natural and Technical Sciences than in the Life Sciences and the Social Sciences and Humanities.

3.2.2 Key figures on the operation of DK

In order to investigate the operation patterns of DK we have selected the number of publications and the time-to-degree. Both indicators show whether the DK provide a well-functioning research environment to the doctoral candidates that allows them to publish their research results and concentrate on their PhD research.

Publications

Based on the document analysis of the 15 selected DK we are able to extract the number of publications. In total, we find 906 publications involving 556 doctoral candidates so far.²³ This implies that on average each of the doctoral candidates would have published about 1.6 publications.

The average number of publications differs between scientific disciplines. On average each of the doctoral candidates in the Natural and Technical Sciences has about 3.9 publications; these are about 1.2 publications in the Life Sciences and 0.7 publications in the Social Sciences and Humanities. When interpreting these publication numbers it has to be considered that they do not reflect differences in the performance of the DK but differences in the publication cultures of the scientific disciplines. Looking at the level of individual DK differences in the publication behaviour are even bigger; here we find a range from 0.3 to 5.3 publications per doctoral candidate.

Analysing the reports we also find that DK emphasize doing joint publications. This is in particular evident for those doctoral candidates who have been abroad for a longer research stay and often have joint publications with researchers from their host institution or lab. Moreover, a number of publications can be classified as interdisciplinary as DK also provide options for interdisciplinary research collaboration. However, in the long run we can expect that more publications from the DK research will be published as publications are often accepted and printed after the graduation of the doctoral candidates (even though the publication may then not be assigned to a DK as the graduates have been become affiliated with other research institutes or universities).

Time to degree

From the 34 DK participating in the FWF survey only 12 DK provide sufficient data on their graduates and time to degree.²⁴ We define time to degree as ‘the length of stay in a DK before having been awarded the doctoral degree’. On average, a doctoral candidate who successfully completed the doctoral degree had spent about 40 months in a DK. The median of the length of stays of graduates is ranging from 36 to 58 months for the individual DK (in comparison BMWF uni:data shows that the PhD study at Austrian universities took on average a total of 8.3 semesters (around 50 months) for graduates from the academic year 2011/12). There are also differences in the average time to degree between the scientific areas. In the Life Sciences the graduates have been staying in a DK for 43 months on average, these were about 36 months for doctoral candidates in the Natural and Technical Sciences and 53 months for doctoral candidates in the Social Sciences and Humanities.

²³ Data include all publications that were indicated in the evaluation reports observed in the document analysis (autumn 2013).

²⁴ Within the analysis only those graduates with a time to degree above 15 months have been considered.

From the data a total of 94 graduates have been identified who were able to complete their doctoral degree in less than 36 months. However, while this result seems to confirm that completing a doctoral degree within three years is manageable, the numbers have to be read carefully. On the one hand the number of graduates does not provide a valid basis to draw conclusions as the number of DK under review that provides sufficient data is too low. Furthermore, as the time to degree is dependent on a number of different factors a more sensitive analysis based on more exact information on the educational trajectory of the doctoral candidates needs to be done. In this analysis also aspects like the degree of interdisciplinarity of the thesis/doctoral research and eventual time constraints posed by the course program or by a longer stay abroad should be considered.

3.2.3 Institutional support

The FWF DK Programme requires that the host institution provides support to set up a DK. It is evident that institutional support is provided in very different forms. Here the document analysis reveals that the host institutions generally support DK in terms of infrastructure, human capital, training, international meetings and conferences, and financial support.

All host universities supported the DK by providing rooms, infrastructure and technical equipment. It is also common for the host institutions that they support the DK in terms of human capital. This is often done by providing additional fellowships for doctoral candidates. Here some universities fund the same number of fellowship positions as the number of positions funded by the FWF DK Programme. Other host institutions provide positions for postdocs or for administrative and IT support. Time compensation for faculty members is also frequently used, for instance reducing time for teaching obligations by 10-25%.

Another important form of institutional support is to contribute to the course programme of the DK. This is done for instance by opening the university/institution's course programme to the DK doctoral candidates or to provide free German classes to the international DK students. Also funding of guest lectures and guest professors is among the forms of institutional support. Five universities also allow doctoral candidates from the DK to teach, i.e. to gain teaching skills during their doctoral studies. Again, a minor group of universities supports the international networking activities of the DK by providing additional funds for travel costs for students as well as for faculty members. Other monetary support is given for recruitment and selection or by waiving tuition fees for the doctoral candidates.

3.3 Some data-based evidences

The aim of this chapter was to give a first insight in the current state of the FWF DK Programme. From the results we want to highlight the following evidences:

1. The selection of DK is well-functioning. At the entrance port there is a relatively low approval rate (the approval rate of full proposals from concept proposals is at 31% on the project level and 24% on the funded budget level) while the rate of approvals for a second and third funding period is relatively high. This can be understood that within the selection at the entrance port the most promising and sustainable DK have been selected.
2. The majority of the FWF DK is in the scientific area of the Life Sciences and the Natural and Technical Sciences. DK in the Social Sciences and Humanities are less often presented in terms of doctoral candidates and funding. These disciplines are also less active in handing in concepts or full proposals than the other disciplines.

3. The FWF DK Programme includes a high number of Austrian higher education institutions as well as public research institutions. The FWF DK Programme has also stimulated cooperation among Austrian institutions in research and doctoral training. Nonetheless, there is evidence that to some extent DK concentrate on the Vienna region.
4. The faculty of the DK is selected carefully and represents scientific excellence. However, the integration of female professors in the faculty is still low. This is mainly due to the fact that in most scientific fields women are still hardly presented among professors.
5. On the level of students a balance of female and male doctoral candidates has been achieved in the DK. Also, the percentage of international students among doctoral candidates in the DK is very high, and clearly differs in this respect from the overall population of doctoral candidates in Austria.
6. Referring to the number of publications of doctoral candidates DK seem to provide a well-functioning research environment. On average all doctoral candidates have been publishing during their doctoral studies. International and interdisciplinary collaboration are important incentives here.
7. There is some evidence that the time to degree is shorter for doctoral candidates from a DK than for candidates who have been trained in other settings in Austria. Disciplinary differences in the time to degree are similar to the overall student population with candidates from the Natural and Technical Sciences completing their degree faster than candidates from the Social Sciences and Humanities. Nonetheless, due to a lack of sufficient data results for the time to degree for the doctoral candidates have to be read carefully. In particular, to evaluate whether a period of 36 months is sufficient to complete a doctoral degree more detailed data would be needed.
8. The DK are well embedded in their institutional surrounding. Host institutions generally provide infrastructure, fellowships for doctoral students and in some cases also support the international mobility of faculty members and doctoral candidates.

4 Practices of doctoral training in Doktoratskollegs

The FWF DK Programme aims at a number of goals that are related to the improvement or reform of doctoral training. These goals have already been described in more detail in the introduction. Among these goals the training of the most talented early stage researchers and the improvement and reform of doctoral training are the most important. This latter goal can also be understood as strive for a stronger professionalization of doctoral training and a stronger orientation of doctoral training to international standards. In the following the overall functioning and performance of the DK will be analyzed as regard these aspects. Here we will first look at the day-to-day practices of DK: the selection of doctoral candidates, the supervision practices, the training programme and the internationalisation of the DK will be described. The practices will in a further step be reflected as regards the question whether they show a stronger degree of professionalization and are oriented towards international standards for doctoral training, in particular the *Principles for Innovative Doctoral Training*.

Methodology

For the description of the implementation of the DK the document analysis and the FWF DK survey have been used.

Document analysis

The following description of the practices of the DK is based on the document analysis of full proposals and evaluation reports of 15 selected DK. These data have already been described in the methodology section of chapter 3. Here the full proposals and the evaluation reports provide the data for the following analysis. While the full proposals demonstrate the plans made by the DK faculty the evaluation reports mirror the actual implementation of the plans against practical challenges that might be established by the institutional context and the discipline. Thus, using both sources gives a more detailed picture of the daily practices in the DK. Information from the stakeholder interviews that will be represented in the next chapter will complement the results. For the analysis qualitative as well as quantitative information on the implementation and performance of the DK has been extracted.

FWF DK survey

Also some data have been retrieved from the FWF DK survey. This data source has already been described in detail in the methodology section of chapter 3.

4.1 Practices of doctoral training

As stated above this section will investigate into doctoral training practices that have been concluded from the full proposals and evaluation reports. In the following the procedures to select and supervise doctoral candidates, the course programmes and the internationalisation of the DK will be analysed.

4.1.1 Selection of doctoral candidates

The FWF has established guidelines for the recruitment and selection of doctoral candidates participating in the DK: To select the most promising and talented doctoral students the FWF suggests to organise the recruitment and selection in a public and competitive procedure. In addition to that, the recruitment should be organised in a transparent way and take place on an international level. Both, internal and associate students should be recruited by the same procedure.

Apparently, the guidelines have been taken up by the DK and translated into individual practices. We find that in the majority of the DK under review the following four steps have been developed to recruit and select students:

1. Announcement of open positions
2. Collection of applications and first selection of potential candidates
3. Candidates' hearing
4. Final selection and acceptance letter

Announcement of open positions

Overall we find that the DK organise the announcement of open positions in very similar ways. Most often the following channels are used:

- Publication in international journals
- Publication on own website
- Publication on websites of affiliated research programmes or research networks
- Distribution via personal channels of faculty members
- Posters and flyers sent out internationally

In addition to that some DK also use job portals and exhibitions as well as alumni and professional networks.

The recruitment and selection procedures are organised by the faculty members. Some of the DK report that they find it difficult to reach out for the most talented and highly qualified doctoral candidates as these are mostly attracted by other top European PhD Schools. In this respect some, in particular smaller DK report that they are aware about their low international visibility and that they have implemented different strategies to increase their (international) visibility. Among these strategies are:

- Increase in the number of recruitment procedures (in particular done by a few larger DK, small DK mostly recruit new students once per year)
- Collaboration with SFBs or other doctoral programmes at their host universities
- Organisation of summer schools for Master's students to become familiar with the DK

Collection of applications and first selection of potential candidates

All DK request interested students to send in the following documents when applying for a position in a DK:

- Letter of motivation
- CV and list of publications
- Letter of recommendation or indication of potential referees
- Proof of English proficiency

From the applications received the most eligible candidates are selected for the candidates hearing. The number of received applications per year or per announcement of open positions differs strongly across the DK. Indeed, for the ten DK which provide data on the number of applications the average number of applications received per announcement of open positions ranges from 37 to 574.²⁵ Comparing the total

²⁵ These numbers represent the average number of applications received per call; they do not display developments in the number of applications over the years of the DK.

number of applications to the total number of positions offered in the calls we also find differences between the DK. Here the average number of applications per open position ranges between 4.1 and 37 applications per position offered. There is no evidence that the number of applications is determined by either the size of the DK or the number of faculty members. Rather, the number of applications might be influenced by a multitude of factors; among these might be the attractiveness of the DK's research topic as well as the scientific excellence of the faculty members. Also, successful strategies to reach out for doctoral students might be reflected in the application numbers. Unfortunately the available data do not allow investigating further in these issues.

In the majority of the DK a similar set of selection criteria for doctoral candidates is used. Eligible DK candidates are usually required to already have some specific knowledge in the field of research (proved by a master's degree with excellent grades and a letter of recommendation), good command of English, high intrinsic motivation and scientific interest, the intellectual capability to pursue an academic career (proved by the motivation letter and in a later stage by the hearing), communication skills and team player qualities (both proved in the hearing). Moreover, candidates that apply for studying within a DK framework have to demonstrate willingness for international mobility (as for instance, to move to Austria or to spend a research stay abroad).

Candidates' hearing

The candidates who have been selected from the received applications are invited for a structured and systematic hearing. Mostly the hearing lasts for two up to three days. Thereby, the main building blocks of hearings are:

- Presentation of the FWF DK Programme
- Those DK that aim to match the applicants to research projects give a presentation of the positions offered in the respective research projects.
- Interviews with applicants
- Site visits in the research facilities

Interviews are usually conducted as group interviews, i.e. a committee of faculty members conducts an interview with one applicant. During the interviews the applicants are mostly asked to present their master thesis. Some DK also require the applicants to discuss a journal article to demonstrate their scientific knowledge as well as their presentation and communication skills. Interviews are generally done in English; just one singular DK in the Social Sciences and Humanities also conducts interviews in German.

For candidates coming from overseas sometimes telephone interviews are used. But in general DK have some extra budget to reimburse travel expenses to applicants so that all pre-selected students can participate personally in the hearings. Thus, students from a lower social status or lower-income countries are not discriminated.

Indeed, DK differ to some extent in the organisation of the hearing. In a few DK interviews take about one hour while others organise hearings that last for even two or three days. The documents also reveal that some DK have changed their practices over the years. While DK in the field of Life Sciences and Natural and Technical Sciences aim to practice a well-organised hearing already in the first funding period, DK in the Social Sciences and Humanities show a learning curve when moving from one funding period to the next. Thus for instance, one of the DK being established in the field of the Social Sciences and Humanities moved from selecting students on paper base in the first funding period to face-to-face interviews in the second funding period;

finally in the third funding period this DK started to conduct interviews with committees of three to four faculty members.

In contrast in the Life Sciences many DK follow the aim to match doctoral candidates with research projects during the hearing sessions. Therefore the different research projects with open positions are presented during the hearing. There is also room for discussion where applicants have the chance to gather more detailed information on the proposed thesis projects. Then during the hearings the applicants are asked to rank the projects according to their preferences.

Final selection and acceptance letter

The final selection of the doctoral candidates takes place after the hearing and is done by the faculty members. Mostly the faculty members rank the applicants; here some DK have implemented complex procedures as for instance, they use scales to assess different criteria or matrix structures. Depending on whether a matching of doctoral candidates and projects is intended, DK candidates generally receive an offer for a specific research project position or a general acceptance within three to seven days after the hearing.

Acceptance rate of doctoral candidates

Among the DK we find different levels of selectivity. While in one singular DK the success rate for applying for a position in the DK is considerably low at one percent; in two other DK every fifth applicant had a chance to be selected as a doctoral candidate. In the other DK about 3 to 14% of the applications were successful. However, based on the analysis we do not find that these differences are related to the discipline, size or age of the DK.

Data on the selection of students also reveal that in some DK not all students who were participating in the DK have been selected in the recruitment process. Hence, there are three DK that seem to fill just about 50 to 70% of their positions in a competitive selection procedure. According to the evaluation reports some DK do not select associate students via the competitive procedure either. Here different reasons are reported for this approach²⁶:

- In particular in the first funding period some DK select those doctoral students as associated students who were already working with faculty members and linked to the research programme because of their research projects.
- Associated students are also recruited by other practices. Mostly they are already known by the faculty members or the selection is done by face-to-face interviews.
- The status of an associated student is also often given to students who already hold scholarships (e.g. IHS scholarship, Marie Curie). In this case the faculty members do not need to apply for additional funding.

For four other DK it is evident that more doctoral candidates have been selected in the recruitment processes than doctoral candidates actually participating in the DK. This 'overload' might also be the reason why here every fifth student seems to have left the DK. Unfortunately the evaluation reports do not indicate reasons why the number of selected students is higher than the number of participating students.

When looking at the selection procedures it becomes clear that all ten DK that provide data on the selection and recruitment processes have been applying public, transparent, competitive and internationally oriented

²⁶ Here it has also to be mentioned that one DK reports that it does not fill all open positions during the selection procedure when there are not enough well qualified candidates available. Open positions are then filled throughout the year with the most promising candidates.

selection procedures. Nonetheless, some of the DK did not apply the selection procedure to the associate students.

4.1.2 Supervision of doctoral candidates

One of the major goals of the DK Programme is to provide besides excellent research opportunities also excellent training conditions for doctoral candidates. The organisation of supervision forms a fundamental for the training conditions of doctoral candidates. Within the guidelines of the programme DK are required to set up a concept for supervision. This concept should regulate the interactions between the supervisors and the doctoral candidates and also the frequency of supervision talks. However, the guidelines of the FWF DK Programme do not prescribe any form of supervision of doctoral candidates and leaves the organisation to the individual DK. With this regulation the FWF aims to achieve a high degree of flexibility to allow all scientific disciplines to participate in the funding scheme while maintaining some of their needs and traditions in doctoral training.

Apparently, a common standard in the reform of doctoral training in the recent years (as it is also strongly recommended by the *Salzburg Principles*) has been to reduce the strong dependency between the student and supervisor that is prevalent in traditional forms of doctoral training, in particular in the master-apprenticeship model. One way of dismantling is to distribute the responsibility for the supervision on different actors, as for instance by separating the supervision of the research work from the assessment of the final thesis and/or by sharing supervision tasks among different actors. Also setting up clear rules for the scope and the frequency of supervision has contributed to a decrease in the strong dependency of the doctoral candidate from one supervisor.

Most of the DK report in detail on the organisation of the supervision of the doctoral candidates; in total data from 14 DK are used for the following analysis. What becomes clear from the evaluation reports and the full proposals is that these DK have set up clear rules and procedures for the supervision of doctoral candidates. To distinguish between different forms of supervision we have been looking at the main responsibilities of the main supervisors, the role and composition of an additional thesis committee, as well as on the frequency of meetings with the thesis committee and of progress reports.

As regards the main responsibility for the day-to-day supervision of the doctoral candidate all DK under review have decided to have one faculty member to take over this role. Stable teams of at least two supervisors who are responsible for the day-to-day supervision of the doctoral candidate were only mentioned by two DK. In some DK this 'main' supervisor is supported by some additional roles. Here two DK indicate that for the day-to-day work also external or personal mentors are appointed who are supporting the candidate in issues that might not be directly related to the research work. In some other DK the 'main' supervisor can also receive support from a co-supervisor (also external co-supervisor) or from an internal DK working group. One DK reports that the role of the co-supervisor is used to train postdocs in the supervision of doctoral candidates, here experienced and less experienced faculty members are matched and take over the supervision.

In addition to the main supervisor all DK under review have established a *thesis committee* as a second body in the supervision of the doctoral candidates. This thesis committee takes over different tasks: it either plays a role in the supervision and the final assessment of the candidate or its role is just limited to the final assessment. From the 14 DK under review in ten DK the thesis committee is also participating in the supervision of the student. In four DK the thesis committee plays an important role in the final assessment of the thesis. In the case the thesis committee is participating in the supervision of the doctoral candidate it is not involved in day-to-day cooperation. In the majority of the DK meetings with the thesis committee take place

annually.²⁷ Doctoral candidates have to prepare for these meetings by handing in written chapters and/or presenting the current state of their work. Mostly, the doctoral candidates also have to report on their work progress during the last year; also goals and plans for the coming year are set. When the role of the thesis committees is limited to the assessment of the thesis, it does not take over supervision or monitoring tasks. As a general pattern we find that those DK which have not implemented a thesis committee in the supervision and monitoring of the doctoral candidates yet use co-supervisors to put the supervision task on more people than just the main supervisor.

The composition of the thesis committee is different among the DK. In the majority of the DK the thesis committee has about three members, in three DK the committee consists of four members. In ten DK the committee indeed consists of members as follows:

- the main supervisor of the doctoral student,
- a further faculty member from the DK and
- an external member from a different institution.

Here the majority of DK also allows including international members. Three of the DK apparently do not include external members in the thesis committee; here members are recruited among the faculty members. Among these three DK it is evident that there is also one singular DK that stopped involving external members in the thesis committee in the third funding period. Also we find that internal recruitment of the thesis committee is more prevalent in the Life Sciences DK.

Thesis committees are also established in different ways; in most of the DK the doctoral candidate and the main supervisor select the members of the committee at the beginning of the doctoral study. In DK where the thesis committee takes over the role of assessing the thesis these are selected shortly before the defence. Here in some DK the faculty members decide on the final composition of the thesis committee.

It can be stated that within the DK new forms of supervision have been established over the years. It becomes in particular clear that the responsibility for the supervision of doctoral students is now shared among different actors as DK have implemented either teams of supervisors and/or are using thesis committees that are also engaged in the supervision and the progress monitoring of the doctoral candidates. Doctoral candidates are thus not solely dependent on a single supervisor. Most of the DK also use the chance to integrate international supervisors in the thesis committees which gives doctoral candidates the possibility to extend their international professional network.

4.1.3 Training programme of the DK

Doctoral training in the DK should be different from doctoral training in other, more traditional settings. To realise this goal the DK are required to set up a training programme for the doctoral students that consists of different elements. Besides being integrated in excellent research and receiving organised supervision, the training should include a course programme that allows the doctoral candidates to receive a set of qualifications that includes research as well as transferable skills. As the FWF does not prescribe how the course programme in the DK should look like, the DK are free to decide on the design of the course programme. The course programme can thereby be linked to a general course programme in doctoral training offered by the host institution and/or it can be open to other doctoral candidates at the host university.

²⁷ In two DK these meetings even take place every six months.

In the following we will investigate what kind of training goals have been stated by the DK. In a second step we will analyse in more detail how the DK have organised their course programme.

Goals of the doctoral training

Generally, it is evident that the training goals stated by the programme guidelines have been translated into more specific goals by the DK. For this purpose, most of the DK have distinguished between goals for scientific skills and transferable skills.

As regards *scientific skills* the majority of the DK under review state that the graduates should acquire competencies as follows:

- DK graduates should become experts in their fields of research and should be able to perform original research.
- DK graduates should be able to take an interdisciplinary research perspective.
- DK graduates should develop critical reasoning skills that are necessary to discover new knowledge.

As regards *transferable skills* the majority of the DK state the following goals:

- Graduates are able to participate in international research and build networks with international partners.
- The graduates are innovative, resourceful, and self-motivated.

In total, the DK thus take up the goals of the DK Programme and show that they are aware of the need to prepare doctoral candidates for different labour markets and to build up competencies that will be applicable in different contexts. Nonetheless, the main focus of the training is on research.

Course programme

To realise these training goals each DK has established a course programme for the doctoral candidates. As already stated above, when setting up the course programme the DK are free to participate in the training programme of the host institution, also by opening the course offered by the DK to other doctoral candidates of the host institution. However, DK also set up autonomous course programmes that are limited to the DK's doctoral candidates only.

The screening of DK evaluation reports and full proposals revealed three main patterns in organising the course programme: While there are some DK that have completely overtaken the course programme offered by their host institutions, others combine some of those courses with their own trainings to meet the specific training needs of their doctoral students. Finally, some DK organise a complete course programme for their doctoral students. The DK also differ as regards the openness of their trainings. Some DK open their courses for non-DK students, while others restrict access to the DK students. Almost all DK report that evaluations of lectures and courses take place as this is usually a mandatory exercise of the university.

For completion of the PhD study there is the regulative rule that all DK students must collect 180 European Credit Transfer System points (ECTS) in Austria. Analysing the practices of the DK we find that most of these credit points are granted for thesis writing (about 120-150 ECTS). The remaining credit points have to be earned in trainings. As already mentioned in the previous section the aim is to train doctoral candidates in scientific as well as in transferable skills. Consequently, course programmes offer courses to train both skills.

Courses in the area of *scientific skills* usually cover:

- Training in basic or specific research areas (seminars/lectures/courses/summer schools) offered by faculty members
- Training in understanding and discussing current research in literature seminars or journal clubs
- Presentation and discussion of DK students' research (graduate seminar, research seminar, retreat), either this is organised as a weekly seminar (with students presenting about once a year or semester) or alternatively as a 2-3 days meeting, taking place annually
- Organisation of conferences or PhD symposia (where students take care of inviting speakers, compiling the programme, designing the poster and chairing sessions)

We find that the number of ECTS that are granted for research training ranges from 20 to 65 ECTS points. In particular DK in the Social Sciences and Humanities are granting a higher amount of ECTS for research training; here doctoral candidates have to earn 52 to 65 ECTS. In the Life Sciences and the Natural and Technical Sciences the number of ECTS to be earned in research training varies between 18 and 34. We also find that in general most of the scientific curriculum is held by faculty members, some by international guest researchers.

Transferable skills training is included in nearly all curricula and has gained importance during the recent years. In particular DK that are already in an advanced funding period have been extending their training goals in that direction. Additionally, recent developments in the training of doctoral candidates have also been reflected in some DK. Here the preparation for different labour markets outside academia is seen as an important asset. The preparation for careers in non-academic sectors also on an international scope has gained importance especially in the field of Life Sciences and Natural and Technical Sciences. Indeed, about one third of the DK report that students ask for better support of career development with special emphasis to prepare for a career outside academia. Here three approaches stated by the DK have to be mentioned:

“In order to support the personal development of the doctoral candidates and to enhance their employability in academia as well as on the job market outside academia, a special emphasis was given on a broad offer of transferable skills training.”

“We anticipate [...] students to be excellent candidates for research careers in academia, industry or science-related fields (science management, patent offices, editors of scientific journals etc.).”

“Finally, the availability of young researchers excellently trained in modern biomedicine will lay the grounds for small “start up” companies and investments of bigger pharmaceutical companies and thus help to further develop biomedical industry in Vienna and Austria.”

Transferable skills training has thus been integrated in the DK curricula; in fact most DK in the Life Sciences and the Natural Technical Sciences offer additional courses or seminars, as for instance:

- Industrial partners are invited for lectures or discussions or DK alumni are invited to present their job profile and daily responsibilities;
- Career-coaching groups are set up to prepare the students to succeed on the international job market;
- Training is offered to learn how to communicate research to the general public or specific target groups (among them there are also potential employers);
- Training on entrepreneurship and IPRs;
- Advice on planning a career in academia and options in the job market outside academia

- Training on preparation of scientific CVs, motivation letters or grant proposals, job market rehearsals and mock interviews

Indeed, six of eleven DK which report on the system how they grant ECTS indicate that they are also granting ECTS for transferable skills training. We also find that two DK offer training for transferable skills but do not grant ECTS; three DK do not indicate whether they grant ECTS for transferable skills or not. However, mostly two to eight ECTS are granted. Though some DK do not value transferable skills training in terms of granting ECTS we find that these trainings nonetheless play an important role for the DK.

The screening of the evaluation reports and the full proposals has shown that the DK have taken up the idea of offering an outstanding doctoral training programme. As regards their training goals the DK aim at preparing their doctoral candidates to become excellent researchers but also to be able to meet the requirements of different labour markets. The course programme offered to the students also takes up these goals. Here, we find that transferable skills training has gained more importance in the course programmes in the recent years and that the DK have taken different measures to adjust the course programme to the training needs of the students.

4.1.4 International exposure

Internationality is a cross-cutting characteristic of the different DK activities as both research and training should be internationally oriented. There should be also opportunities provided that doctoral candidates become integrated into international scientific collaborations and networks, and above all the DK should be open to international students. Here the guidelines recommend that around 30% of the doctoral candidates should be international students. In addition, the programme guidelines recommend that the doctoral candidates should spend at least three months abroad. It is expected that the faculty members support the doctoral candidates by providing them international contacts and integrating them into their international networks. To trigger the international mobility of students indeed different incentives are provided as for instance, there is the option given for doctoral students who have been abroad for a period of three months in the first three years of funding that they can prolong their funding duration for a further year; i.e. that they receive a fourth year of funding plus the option to make a further research stay of three months abroad.

Hence, in the following we will focus on three aspects of internationality in the DK. First, we will investigate the role of international students in the DK, secondly we will look at the stays abroad by the doctoral candidates, and finally we will investigate into further internationalisation activities.

Origin of students

According to the guidelines of the DK Programme the DK should try to integrate about 30% of international students; also the announcement and recruitment of doctoral candidates should be done on an international level. The survey among 34 DK reveals that from the 1,121 doctoral students represented in the survey about 639 students were international students (57%). Apparently, the percentage of international students varies strongly among DK as it ranges from 29 to 94%, in 25 out of the 34 DK the percentage of international students is above 50%. There are only small differences between the Life Sciences and the Natural and Technical Sciences, here 53% of the doctoral candidates come from abroad, in the Social Sciences and Humanities these are about 63%. The number of international students in the DK is thus above average. National data on all doctoral students in Austria show that in the winter term 2013 about 26.8% of them came from abroad (BMWF uni:data).

The international students in the DK come from very different countries: On average eleven different countries of origin are represented by the international students. While differences in the number of countries represented in the DK are only low between the Life Sciences (12 countries) and the Natural and Technical Sciences (11 countries), there are fewer countries represented in the Social Sciences and Humanities (8 countries). Apparently, the majority of international students are Germans, followed in numbers by students from Asia (India, China, Japan and South East Asia). Students from Asia are especially found in the Life Sciences DK. The third major group of international students comes originally from Eastern Europe (Poland, Russia, Ukraine, Czech Republic, Hungary and Slovakia). Only a few students come from Western Europe or overseas (apart from Germany) in order to participate in the DK Programme. In our view these numbers confirm to some extent that Austria functions as a hub between the East and the West in terms of flows of international students and doctoral candidates. However, the low number of international DK students from Western Europe (apart from Germany) indicates that mobile students from other countries might prefer to do their PhD in other locations than Austria. Nonetheless, it can be concluded that DK are attractive for students from a diversity of countries. Also, the DK seem to manage this diversity very well.

Stays abroad

The guidelines of the programme strongly recommend that doctoral candidates should spend at least three months abroad. Here the programme also provides different funding instruments and incentives for the students as for instance the possibility to receive funding for a fourth year. Stays abroad mainly aim to contribute to the international research experience of the doctoral candidates and they may also foster to build up and widen international networks; also the chance to look for a postdoc position at a research institution abroad is given here.

For this purpose the DK Programme funds besides longer stays also short stays abroad. Among these are conference visits, training by international experts etc. The short stays also contribute to the international profile of the doctoral candidates and help them to build up their international networks.

The document analysis of 15 DK reveals that stays abroad are performed very differently across the DK. The majority of DK (14 out of 15 DK) reports that some of their students were abroad for at least one month, 8 of 15 DK report that some of their students went abroad for a period of six months. Thus, the percentage of students going abroad for at least one month varies between 9 and 94% (on average 45%), for longer stays of six months it varies between 4 and 52% (on average 12%). In 10 out of the 15 DK under review the percentage of students going abroad for a long or a short stay was below 50%. In contrast, four DK report that more than 50% went out for a short stay abroad but less than 50% were staying abroad for a six months period. Only one singular DK reports that more than 50% of the students went abroad for long and for short stays. However, based on the document analysis we do not find that the number of students going abroad depends on the discipline or the number of international students in the DK. Unfortunately the data do not allow to investigate other factors like the international integration of faculty members or the nature of the research project which may play an important role for the mobility of the doctoral candidates.

Apparently, doctoral candidates spend research stays abroad for different reasons. While doctoral candidates from the Life Sciences or Natural Technical Sciences mostly spend time at universities or laboratories abroad, students in the Social Sciences and Humanities more often use stays abroad to visit archives, conduct surveys or do interviews. Again, the available data do not allow investigating the outcomes of the visits in detail, for example how many joint publications have been written and/or sustainable international networks have been built.

Nonetheless, the DK are aware that more of their doctoral candidates could be internationally mobile, in particular that the number of candidates spending six months abroad could be increased. On the other hand some of the DK also report that the need for longer research stays abroad during doctoral studies should be evaluated very carefully. They argue that the research stay abroad should advance the research project of the doctoral candidate and should be compatible with the personal situation. They also argue that students with less international experience should be more strongly encouraged to go abroad than others. Also the origin of the doctoral candidate plays some role for the decision to spend a longer research stay abroad. Here some DK recommend Austrian students to go abroad while they recommend international students to collaborate with other Austrian research institutes.

The following illustrates the different views of DK on the research stays abroad:

“It has been our policy to carefully assess the need of such a secondment together with the students, who were encouraged but not compelled to use this option. None of them actually needed to make use of the whole period that could be granted; [...]. Instead of visiting a collaborating lab, several students elected to take hands-on courses on a specific subject, to participate in Summer Schools to broaden their knowledge in a particular area, or in workshops dealing with a specific technique needed for their project. Both the visits to collaborating labs and the participation in Summer Schools, workshops, and courses were very well received by the students; all those who went abroad made the maximum use of their stay.”

“For Austrian and European students, these collaborating laboratories were mostly located outside of Austria. Non-European students, however, were also given the chance to go to Austrian laboratories outside of Vienna. The idea behind this was to enhance the relations between these students and as many Austrian researchers as possible.”

“From the perspective of some of the students, secondments are also seen as a chance to identify and test compatibility with an international lab for future postdoc work, right after completing the main body of the PhD thesis.”

As hindrances and obstacles for international mobility the following reasons have been mentioned most frequently:

- As doctoral candidates have to interrupt their coursework, the completion of the doctoral study might be delayed since courses are not offered several times per year.
- Students' research and/or their cooperation with the supervisor might be interrupted, and the stay abroad might not contribute to their research, the risk of delaying the thesis is given.
- International students need some time to get fully adjusted to the new environment and become reluctant to disrupt their research work in Austria.
- The length of the stay abroad depends on the discipline: for some disciplines long stays abroad are useful while others already benefit from short stays.

There is also evidence that the incentive to fund a fourth year also motivates some research stays abroad; but in some of those cases the research stay abroad did not directly support the research project of the student.

International training, networking and supervision

Besides international students and stays abroad the DK also run other activities to enhance the internationalisation of training, research and networks.

We find that almost all DK invite international researchers for guest lectures on a regular basis. These are mostly talks for about 1-2 hours followed by a discussion. A few DK even report that they invite international researchers to lecture an entire course (for example lasting about one week). These courses are mostly not a standard part of the course programme.

Other internationalisation procedures performed by the DK are:

- Research stays of international professors (for example during their sabbatical) to bring doctoral candidates in contact with excellent researchers
- Doctoral candidates organise international workshops and invite international experts
- Attending international conferences
- Attending lectures and summer school abroad
- Involving international researchers in the thesis committee; from the review 6 out of 14 DK have that done yet.

4.2 Professionalization of practices and application of international standards in doctoral training

In the following different forms of practices in the DK will be described and reflected whether they present more professionalised practices and also meet international standards in doctoral training.

As regards the question whether international standards of doctoral training have been taken up in the DK we will reflect their practices against the *Principles for Innovative Doctoral Training*.²⁸ These principles have been developed in 2011 based on a Mapping Exercise of the European University Association and the European Commission undertaken in 2010 and 2011. The principles build on the *Salzburg Principles* for doctoral education and have made them more operational on the institutional level. An inventory of the implementation of the *Principles for Innovative Doctoral Training* in 2013 has shown that these are practised and well accepted in a number of institutions across Europe and contribute to the establishment of a European Research Area (EC, 2014). Therefore the principles cover different aspects of doctoral training; among these are the attractiveness of the institutional environment, the research excellence of the training, interdisciplinary research options, exposure to relevant non-academic work environments, exposure to international networks, quality assurance and the training of transferable skills.

4.2.1 Professionalization of doctoral training in DK

Among the goals of the FWF DK Programme is also that DK should contribute to a reform and the implementation of new modes of doctoral training. These modes of training are mostly understood as renunciation of traditional practices that are associated with the prevailing master-apprenticeship model. Here the DK are seen as an instrument to achieve a stronger professionalization of different procedures and practices in the sense that they might change the strong dependency between the doctoral candidate and the supervisor. Also a framework for doctoral education might be built up that provides clear and transparent rules for the doctoral students and supervisors.

Looking at the selection of the doctoral candidates in the DK we find that here a strong degree of professionalization has been achieved. Throughout the DK under review clear and transparent procedures and rules concerning the selection of doctoral candidates have been implemented. The announcement of open

²⁸ See EC (2011).

positions is public and the DK take care to reach out for a wide audience. Selection criteria have been clearly defined; also the selection procedures have been formalised. When selecting doctoral candidates the faculty members collaborate. Nonetheless, it has to be mentioned that not all doctoral candidates in the DK have been selected via this strongly professionalised procedures. In some DK the rules are not applied to associated doctoral candidates, results also indicate that not all positions in the DK have been filled by these procedures.

For the supervision of the doctoral candidates it can be stated that all DK have implemented structures where the supervision of the doctoral candidate is carried out by more than one person. Though most of the DK still work with a main supervisor who is responsible for the day-to-day supervision we find that supervision is in one way or the other a shared responsibility. Doctoral candidates are thus prevented from being dependent on only one person or one opinion and can ask guidance and support from a number of different persons. Also supervisors do not have to carry the whole responsibility for the doctoral candidate: they can also rely on further opinions and share work.

A major advancement of the DK is the implementation of a course programme. Most of the DK offer course programmes tailored to the specific needs of their doctoral students. The training includes research as well as transferable skills training. With the implementation of a course programme the more occasional training of the traditional doctoral training has been replaced. The need to specify training goals has contributed to a more structured skills training for the doctoral candidates. As the training goals are beyond training needs that eventually might occur in the course of the research, doctoral candidates also become better prepared for later careers. In recent years, some DK have also integrated skills training for labour markets outside academia, particularly in Life Sciences DK.

The different internationalisation practices provide the doctoral candidates with more opportunities to have insights into other scientific work practices that go beyond their home institutions. The opportunity to go abroad for a longer period does not only allow them to learn about international standards in their field of research but it also enhances the integration into international networks and building their own professional networks. The strong internationalisation at home (as represented in the high percentage of international doctoral candidates in the DK) is beneficial for both the DK and the host institutions.

All in all, it can be stated that the DK have established professional procedures for doctoral training. The implementation of standardised rules for selection and supervision, the provision of a course programme and the strong internationalisation have definitely contributed to a reform of doctoral training.

4.2.2 International standards in doctoral training in DK

The question whether doctoral training in DK is oriented towards international standards in doctoral training is to some extent beyond the actual goals that were formulated for the FWF DK Programme. As the *Principles for Innovative Doctoral Training* are rather new the programme documents of the FWF DK did not yet integrate them. Nonetheless, it is interesting to see to what extent the DK have been implementing these standards (no matter if consciously or not).

As the DK are implemented as long-term research groups, in many cases even following an interdisciplinary approach, they provide a stimulating research environment to talented doctoral candidates. In doing so we can state that the principles of research excellence in the training and the provision of interdisciplinary research options are realised in the DK. Also the performance of the DK as shown in chapter 3 reveals that the DK provide a well-functioning research environment. As the DK are able to attract a high number of international students they can also be identified as having an attractive institutional environment. International networking

is implemented in the DK, while there is a strong internationalisation at home, outward mobility of the doctoral candidates is to some extent low, in particular with a view on long-term stays abroad. Nonetheless, it has to be stated that the doctoral candidates in the DK have developed their own patterns of international mobility with preferring short and targeted stays abroad over long-term visits at other institutions. Opportunities to include international reviewers in their thesis committees also give the doctoral students the chance to build their international networks.

The training of a different kind of skills (among them also transferable skills) has gained importance in the DK. In particular the orientation of the training towards needs of labour markets outside higher education and research has become more and more acknowledged by the DK in the recent years. In this sense most DK that have already moved to a third or fourth funding period have been integrating different forms of transferable skills training.

Quality assurance in doctoral training has also been implemented in the training. Here in particular shared forms of supervision, the thorough selection of doctoral candidates and faculty members have to be mentioned. With the legal obligation of the host institution to have a quality assurance system in place also the courses offered to the doctoral candidates are under review. Finally, as some DK have split the personal responsibility for the supervision and the assessment of the thesis this can also be identified as policy for quality assurance.

The question whether DK have been implemented policies to give the doctoral candidates the chance to collaborate with sectors outside academia during their doctoral research cannot be investigated in the framework of this study as there is no data available on this aspect.

Altogether, also for the orientation of the doctoral training towards international standards we can state that central criteria have been implemented in the DK over the years.

5 Significance of Doktoratskollegs

In this chapter we investigate the perspectives of different stakeholders of the FWF DK Programme, i.e. of people involved in doctoral training and/or participating in the FWF DK Programme or in a DK. We aim to analyse the significance of DK in different contexts. Therefore we put special emphasis on the policies and practices of DK and the impact of the DK on the doctoral training at the host institution that is related to the funding of DK at the university. Finally, this chapter will also provide an overview of recent activities and strategies of Austrian universities in the reform and innovation of doctoral training and highlight the role of the FWF DK Programme in this respect.

Methodology

To investigate the perspectives of different stakeholders a wide range of in-depth interviews were done.

In-depth interviews

By the mean of in-depth interviews it was intended to cover as many aspects as possible to answer the questions presented in chapter 2. In total 46 interviews were carried out. The majority of the interviews were done face-to-face, some were done by telephone. Two interviewees were addressed even twice as they offered to reflect the findings.

For the in-depth interviews guidelines (see Appendix I) were used that also allowed leeway for open questions. The sample of interviewees comprised stakeholders of the DK Programme who have been identified by the FWF Programme Management and the evaluation team. Hence, the sample included persons who are directly involved in a DK like Principal Investigators²⁹ and Coordinators, members of the university management who are addressed by the DK Programme like Rectors, Vice-Rectors and Directors of Doctoral Studies, and finally persons who are representatives of doctoral candidates or work in a Center for Doctoral Studies located at one of the Austrian universities. All interviews took place between December 2013 and February 2014.

In the following we present the results of the interviews. First the perspective of the Principal Investigators on their motivation for applying for a DK, assets of a DK, application, administration, review and evaluation procedures and operation patterns will be presented. In a second step findings from interviews with a representative of doctoral candidates and representatives of Centers for Doctoral Studies will be presented. Lastly the role of the DK for the reform and innovation of doctoral training at Austrian universities and the added value of the DK will be discussed.

5.1 Doktoratskollegs from the perspective of the Principal Investigators

5.1.1 Motivation for applying for a DK and the assets of a DK from the perspective of the Principal Investigators

Motivation for applying a DK

For the Principal Investigators the possibility to do excellent research for a period of up to 12 years and to promote and train bright, talented early stage researchers is a very important reason to apply for a DK. All Principal Investigators interviewed are highly motivated to provide structural doctoral training that is embedded in an inspiring research environment. Researchers also appreciate that the FWF DK Programme

²⁹ Some of the Principal Investigators currently hold a position in the FWF Board.

allows them to pursue new ideas and build up excellence in research fields that are in their interest and not determined by the university management or the national research policy. In this respect it is very important that researchers are free to choose their research topics, according to the bottom-up principle (of the FWF).

Assets of the DK

Investigating the assets of the DK, the vast majority of Principal Investigators refers to the interdisciplinary approach of the programme and the possibility to build teams among students as well as among faculty members. In their point of view the team building process is quite sensitive as the Principal Investigator does not just take up the role of the speaker but also is the mentor of the whole team. The interviewees also report different ways of following an interdisciplinary approach; these include practices where a research topic is investigated from different disciplinary perspectives in different research projects and approaches where different disciplinary approaches are combined in one research project. In fact, the Principal Investigators see the interdisciplinary approach of the DK as innovative asset of the programme that provides many opportunities for research and new patterns of intra- and interorganisational collaboration.

The opportunity to recruit international doctoral candidates is reported as a further major asset of the FWF DK as the programme covers all costs (in particular also travel costs of the candidates) for inviting foreign students who have applied for a position in a DK for an interview. On the other hand Principal Investigators report that international recruiting is very time consuming as the selection procedure consists of several elements like the presentation of proposals, in some cases video conferences, hearings, discussion with the faculty members, site visits in laboratories etc. Nonetheless, the Principal Investigators regard the possibility to recruit doctoral candidates internationally as a major asset of the FWF DK Programme. One interview partner even states that he follows the vision *“you get what you select for”*.

Among the interviewees there is no common understanding of the timing and the frequency of the recruitment. In fact the timing of the recruitment is handled very differently by the DK. There are some DK that aim to build cohorts of candidates and some DK that recruit continuously. With both approaches DK search for engaged, talented candidates. However, it is not always possible to select the best doctoral students in the recruitment. The short time frame of the selection procedure might account as one reason for this problem. Mostly it is not sufficient time available to learn more about the qualification and motivation patterns of the candidates; sometimes also the choice of candidates is limited. This is particularly true when the DK faces high competition from other universities. Accordingly, some Principal Investigators and Coordinators argue that it is much easier for DK to recruit good candidates, given the university’s reputation is high and the location of the university is attractive. However, the Principal Investigators also note that the international recruitment increases the internationalisation of the DK and also contributes to a stronger visibility of the DK in its research field.

5.1.2 Application, administration, review and evaluation procedures

Application procedure

All Principal Investigators interviewed are scientists who are regarded as top-researchers in their field. Also they have many years of teaching experience. Scientists applying for DK are usually quite familiar with the different schemes of competitive funding on the national and European level; they are also familiar with the FWF and its funding programmes. Most of the scientists who applied for a DK indicate that they already have had applied for one of the FWF funding programmes before they applied for a DK, in particular with Stand-

alone Projects and Special Research Programs.³⁰

The application procedure for DK is organized as a two-stage procedure. In the first stage a concept proposal has to be handed in by the speaker (Principal Investigator) of a potential DK. This concept proposal is checked by the FWF for formal requirements. Additionally, the concept proposals are checked in an international peer review. Here international peers are asked to send in written reports on the quality of the concept proposals. From those concept proposals that have been evaluated positively by the majority of international peers the speakers of the potential DK are invited to hand in a full proposal for the second stage of the application procedure. The full proposals are again checked if they meet formal requirements and are evaluated by an international peer review. This second peer review is organised as a hearing and takes place in Vienna. During the hearing the reviewers can discuss open questions with the applicants. In addition to the hearing the reviewers discuss the full proposals internally with representatives of the FWF. The final decision about funding of the full proposals is taken by the board of trustees. These decisions are based on the results of the hearing and the evaluation of the international peers.

Principal Investigators generally welcome this two-stage procedure as it aims to ensure high quality. Recommendations made by the FWF Programme Management are evaluated as supportive for the writing of a profound proposal. However, writing a DK proposal is time consuming. The DK applicants are aware of that and are generally used to handle such efforts. Nonetheless, more and more Principal Investigators have become aware in the recent past that the rejection rate in the FWF DK Programme is high; also the fact that project proposals that were being reviewed as above average were rejected because of budget constraints of the FWF contributes to irritation of the Principal Investigators.

Being aware of the low approval rate of applications for DK several universities implemented instruments to support researchers in writing proposals, preparing for hearings etc. These instruments include for example service centres and the provision of experts who train and offer services to both applicants on the level of experienced researchers and doctoral candidates/early stage researchers. At some universities the training of potential applicants/doctoral students is also provided as training within the university's doctoral school.

Programme management and administration

The Principal Investigators and Coordinators appreciate the rather unbureaucratic administrative procedures of the FWF in the management and administration of the DK Programme. The bureaucratic efforts that go along with the administration of an approved DK are regarded as acceptable, also the amount of work that has to be done for documentation and monitoring of the DK is rated as adequate. That is particularly true when comparing the efforts and costs of managing a DK with costs caused by participating in the European framework programme for research and innovation. However, some Principal Investigators are critical about the guidelines of the FWF DK Programme and the way how problems are addressed by the FWF Programme Management. In these respects two major issues have been addressed by the interviewees (Principal Investigators and Coordinators of DK):

- There have been several changes and adaptations of the DK Programme guidelines in the recent years. This has led to a lack of clarity for some guidelines, also redundancy and even misleading guidelines have been mentioned. Some interviewees request more coherence in the guidelines and in the way how problems are addressed. Also, there was a request for more professionalism in the reactions of the FWF, here the interviewees referred to the very high standards of the Swiss National Science Foundation that could serve as a point of reference for the FWF.

³⁰ We note that one Principal Investigator even holds the outstanding Wittgenstein Award.

- The second issue that was mentioned again and again in the interviews deals with the question how to establish equal opportunities for women in a DK who pursue an academic career and have a family. Because of the increasing percentage of female doctoral candidates in the DK this question becomes increasingly relevant. In this respect especially the Principal Investigators request more support by the FWF, for example by demonstrating different ways and good practices how to deal with the challenge of supporting female talent in higher education and research.

Review and evaluation procedures

The interview partners evaluated the review and evaluation procedures for DK as clear, transparent and well known. In particular the organization of the international peer review is appreciated by the Principal Investigators and Coordinators, many interviewees point out that the implementation of this kind of quality assessment was *“the best that ever happened to the FWF and the scientific community”*. The importance of the international peer review for the quality assurance of the FWF DK Programme has also been mentioned by other stakeholders of the FWF DK Programme who are participating in the review and evaluation processes. In their views the international peer review reflects the goal of the FWF DK Programme to fund high-level research projects and excellent researchers. Despite the overall satisfaction and appreciation of the international peer review also a few critical points were mentioned by the Principal Investigators and representatives of the university management. Here it was in particular mentioned that standardized evaluation criteria to assess the planned practices of doctoral training are missing. In this respect it was also mentioned that the review committee mostly not include an expert in doctoral training but that researchers with different backgrounds and experiences in doctoral training are evaluating the plans for doctoral training. Indeed, several Principal Investigators and Vice-Rectors pointed out that they would welcome the integration of a practitioner/expert in doctoral training in the review process.

Some Principal Investigators also mentioned that the peer review should better include the development of the DK in the sense that recommendations and critical points of foregoing evaluations should be better communicated to the members of the review panel. In the view of these Principal Investigators it is required to summarize the outcomes of foregoing evaluations in a more clear way and submit to the members of the review committee as some of them are exchanged for each new proposal. Here especially the current form of support provided by the FWF should be increased: In fact, many interview partners requested a more foresighted engagement of the FWF in the communication of evaluation results; also the selection of committee members should be done more carefully. All in all the interview partners asked for a stronger back up of the process by the FWF Programme Management.

5.1.3 Operation patterns

In chapter 4 the operations and policies in structural doctoral training in DK have been investigated by a document analysis. From this analysis several open questions have been concluded. These open questions will be investigated as follows by including the perspectives of different stakeholders of DK.

Perspective of Principal Investigators and Coordinators

Differences among disciplines

The way doctoral training is organized is very much dependent on the scientific disciplines. In the Life Sciences for example doctoral training already includes a number of aspects of structural doctoral training: Here courses are offered more frequently as well as the supervision of doctoral candidates is done by teams of supervisors.

For other disciplines like the Natural and Technical Sciences and the Social Science and Humanities the interviews report that within the DK news forms of doctoral training compared to doctoral training outside the DK have been established. This difference is strongest for DK in the Social Sciences and Humanities as the doctoral training outside the DK is still mostly organized in the traditional master-apprentice model in these disciplines. In particular for those disciplines the DK seem to build a nucleus for a further reform of doctoral training. In the Natural and Technical Sciences this effect is less clear: here the extent to which structural doctoral training is implemented is mostly dependent on the faculty and persons involved.

Overall, Principal Investigators are very much interested in the idea and concept of doctoral training as put forward by the FWF DK Programme. There are differences by discipline and/or host institution. Especially, the possibility to build up critical mass is often decisive for implementing a DK. In this respect several interview partners also indicated that the building up of critical mass in a thematic field sometimes might not be possible. This difficulty is also seen as main reason why some colleagues might be prevented from applying for a DK.

Changes in doctoral training

In recent years structural doctoral training has become more and more widespread. This development was not just driven by recent European developments but also by the national higher education policy. On the national level the main drivers were the allocation mechanism that enforced the strategic planning of universities. In this respect the DK have become a favoured instrument as they correspond to such developments and support the profiling of universities in research and training.

As the FWF DK Programme requires that a high level course programme for the training of the doctoral candidates is developed DK also provide a curriculum that comprises innovative training elements. Also, the requirement to establish an interdisciplinary research programme is very much appreciated by the stakeholders of the DK as it motivates them to move beyond their disciplinary boundaries and find new approaches to their research fields. The strong support of internationalisation activities is also welcomed by the stakeholders. Implementing these elements affects doctoral candidates in many ways, depending on the discipline they are more frequently integrated in a research-intensive environment and collaborative work structures. Also, doctoral candidates in the DK benefit from collaborating with excellent scientific researchers. To foster interaction among students and faculty, many DK regularly offer seminars, workshops, talks, discussions, courses etc. By these offer doctoral candidates have the opportunity to discuss their research and questions with members of the global research community. In addition to that some DK also organise summer schools to strengthen the interaction and to increase the visibility of their doctoral candidates. Altogether the FWF DK Programme supports the implementation of more structural forms of doctoral training. In this context, the interviewees also reported that the DK offer doctoral candidates collaborative work structures that prevent them from working in an isolated setting. The Principal Investigators evaluated these different aspects of the operation of DK as positive and significant developments. Nonetheless, a few interview partners were critical. In their view structural training provides only a 'menu' of training courses where doctoral candidates can choose from. This menu would not encourage intellectual risk-taking and creativity of early stage researchers.

The role of doctoral candidates and their funding

Doctoral candidates funded by the FWF Doctoral Programme have to go through an international competitive selection procedure. After passing the selection procedure the candidates are employed as research staff at the host university. Here they hold a PhD position with 75% employment (which corresponds to 30 working hours per week). Hence, doctoral candidates in DK are employed as early stage researchers who work on their thesis projects. The funding duration for doctoral candidates in DK is generally limited to three years. According to the

FWF guidelines this funding period can be extended to four years under the condition that the doctoral candidate spends a research stay abroad with an overall duration of three months within the first three years of funding. With this incentive the international exchange of doctoral researchers and the cooperation between researchers at different locations is promoted. Principal Investigators were critical about this regulation. Many interviewees argue that spending a research stay abroad to get a further year funded is not effective as the exchange is time-consuming, the students often do not find good supervision and suitable structures either; finally given the international recruitment and thus the high share of foreign doctoral candidates in the DK, the motivation for a long stay abroad is quite low among those doctoral candidates. Accordingly, a widespread view is that long stays abroad make only sense when the experiences to be made are beneficial for the research project. Otherwise the doctoral candidates lose too much time so that the time to degree might also be extended. This is also the main reason why many Principal Investigators explicitly do not support this incentive; indeed, some even refuse to support it. In addition to that many interview partners oppose the idea that the research stay is related to the funding period of the doctoral candidate. In their view the stay abroad should be a recommendation rather than a condition for funding. Many Principal Investigators underline this claim by arguing that just a minority of doctoral students complete their PhD within three years. There is evidence that the time to degree takes for most PhD students about four years or even longer depending on the scientific discipline. Consequently, many doctoral candidates get funded in the fourth year of study by other sources like competitive funds through Stand-alone Projects, the Anniversary Fund of the Oesterreichische Nationalbank, grants and awards of European initiatives and framework programmes or even by means of institutional funding coming from the university's global budget.

However, the claim for a fourth funding year is not new. Already in the recent past Principal Investigators have pointed out that the three-year funding duration and the option of extension by staying abroad is handled too strictly by the FWF. Moreover, some Principal Investigators allude that the present guideline is challenging with regard to funding because the funding period of the doctoral students might exceed the funding period of the DK. Problems arise particularly when doctoral candidates spend a further research stay abroad in the fourth year of funding. Here the costs have to be funded by other sources in advance by the DK as the FWF only refunds those costs after the proposal for the new funding period of the DK has been evaluated positively in the international peer review. Another challenge is the wage increase of doctoral candidates that must be paid after three years being employed due to the regulations of the collective agreement for employees at Austrian universities. Here, the DK have to overtake those additional costs which have to be funded by means of other sources.

In this respect a few interviewees question the way the funding of doctoral candidates is organized in the DK. There are scattered voices that prefer fellowships above the current practice to employ doctoral candidates at the host institutions. These interviewees stated as 'main advantages' of the fellowships that these are all-inclusive agreements and have no limitation on working hours. As regards the employment of doctoral students it was also argued that the salaries for doctoral candidates paid on the basis of the collective agreement for employees at universities are quite high. Also the easier administration of a fellowship system was mentioned by some of the interviewees. Nonetheless, though there is a minority of respondents that would favour a fellowship system for the funding of the doctoral students the majority of the Principal Investigators are in favour of the current FWF regulations.³¹ This position is in particular put forward by representatives of universities of technology who are strictly against a funding system based on fellowships as there is a strong competition for talents and bright researchers with other research universities and research

³¹ The fact that the regulations commit to the European Charter and Code for Researchers and treat doctoral candidates as early stage researchers strongly supports this consent.

institutions and also with companies and industry in their fields. Higher salaries for doctoral students give them a competitive advantage. Moreover, at these universities it is a common practice to increase the contracts for doctoral candidates to full positions where the ‘missing’ part of the salary are funded by additional sources, either by collaboration projects with industry or other competitive funding sources.

As regards the recruitment of associated doctoral candidates in the DK the Principal Investigators mention that these candidates quite frequently are recruited among doctoral candidates that are funded by other than FWF funds like for example doctoral candidates that are funded by the global budget of the university.³² The associated doctoral candidates benefit from the opportunities/activities (training and research programme) and funding (such as travel costs funded) offered by the DK. These associated doctoral candidates are often regarded as significant to reach critical mass in the DK. In this context a few interviewees mention that staff members who have already done preliminary studies on the subject of the DK are usually the most successful candidates when it comes to the timely completion of their PhD research. Other interviewees report that some of those associated candidates are sometimes overburdened by their double status: being a member of a DK and also being university staff. Thus, among the interviewees there is no clear picture on the benefits of associating university staff members to the DK.

Another point related to the two status groups of doctoral students in the DK refers the awareness of doctoral candidates about their actual status, i.e. being an ‘internal’ or an ‘associated’ student in the DK. While some interviewees argue that DK members certainly know which status they have; others again proclaim that DK candidates do not know if they are ‘internal’ or ‘associated’ – however, according to the programme guidelines all DK candidates should be treated equally.

Altogether both roles, the ‘internal’ and ‘associated’ doctoral candidates are regarded as essential to establish and build up DK in order to achieve a critical mass of doctoral students and increase visibility of a research field. Nonetheless, the vast majority of Principal Investigators calls for more flexibility in the funding regulations of the DK, particularly for more flexibility concerning the funding duration of doctoral candidates. In their view the policy to incentivise international mobility of the doctoral candidates by making the funding of an additional year dependent on a long-term research stay abroad is regarded as ineffective. Consequently, many interviewees request a more flexible handling of this regulation, i.e. instead of only considering a long research stay abroad also short-term, coordinated and reciprocal research visits by doctoral candidates at partner institutions, active participation in international conferences, seminars, workshops etc. as well as inviting visiting researchers and lecturers from abroad etc. should be accepted as internationalization activities that make the doctoral candidates eligible for a fourth year of funding. However, the majority of interviewees agreed that internationalisation is nowadays an essential for a research career.

Later Careers of DK graduates

As already shown in the document analysis the employability of doctoral candidates on labour markets outside academia and the training of transferable skills build an important aspect in the doctoral training of DK. To support professional development training modules to develop transferable skills are offered. Besides these transferable skills the DK provide a number of activities that prepare doctoral candidates for a later academic career as the candidates participate in excellent research, become integrated in the scientific community and network of their supervisors and the wider faculty of the DK. Doctoral candidates in a DK usually also participate in research-related activities like conferences, peer review exercises and collaborative meetings as well as they have the opportunity to establish their own networks of scientific partners. In this respect research

³² The practice to associate also university staff members is explicitly supported by the FWF Board.

stays abroad are decisive for later career paths as graduates often publish with partners at host institutions and continue these collaborations after they have returned to the DK. Finally, this collaboration can be an important factor for their later career as DK graduates often receive a job offer (for example for a postdoc position) at their host institutions.

As regards the later careers of the DK graduates the interviewees report that most of them continue in academia, for example they go abroad for a postdoc position or pursue an academic career at an Austrian institution upon graduation. Here it was also reported that currently only a few DK graduates going abroad returned to Austria and continue with an academic career at an Austrian institution. This is in the perspective of the interviewees mostly related to the tight academic labour market in Austria and the lack of attractive positions for excellent researchers (e.g. positions at the level of an associated professor). Accordingly, DK are regarded as an important starting point, sometimes even as a bottleneck to select the future Austrian professoriate. Career paths in the company sector as well as in the public sector are not reported as a common career path for DK graduates. This might account for the practice of DK to primarily prepare their doctoral candidates and graduates for the international academic job market and focus more strongly on research training. The rationale that the more research experience graduates have, the more professional their training is and the more high ranked papers they have published, the more successful they will be is essential for the operation of the DK in this respect. According to the Principal Investigators the employability of DK graduates is high, facing that many DK graduates hold academic positions at renowned colleges, universities and research institutions abroad, even at outstanding universities like Harvard. At the same time it has to be considered that many DK are just in the first and second funding period so that there are only little experiences and data available on the further career paths of DK graduates so far. However, overall it seems that DK are successful in placing their graduates on the international (academic) job market.

Gender equality

To promote equal opportunities for men and women in science and academia DK aim to support gender equality by two measures: first, by increasing the number of women on the student/early stage researcher level and second, by increasing the number of women on the faculty level. For the latter the FWF recommends that 30% of the faculty members should be females. All Principal Investigators interviewed are aware of this recommendation. However, given that females are still underrepresented among professors in some scientific disciplines it is hard, sometimes even impossible for the DK to reach out for this percentage.³³ Therefore some Principal Investigators aim to achieve a higher percentage of female faculty members by inviting engaged female researchers working on ranks below the professoriate to become faculty members. In some cases this policy was criticised within the international peer review. Here some of female faculty members who were not a professor were excluded from the faculty by the international peers as they were regarded as not being excellent or not having an adequate track record.³⁴ Because of these incidents some Principal Investigators are also critical about the way the recommended quota is communicated to the international peers. From the perspective of the Principal Investigators many of the members of the international peer review committees seem to be not aware of the background of the quota and do not adequately appreciate the motivations of the DK when inserting female talent below the rank of the professoriate in the faculty team. Other Principal Investigators report that they address gender equality foremost by increasing the number of female doctoral

³³ While reaching out for gender equality is in particular a problem in the Natural and Technical Sciences, it is less problematic in the Social Sciences and Humanities. When discussing with Principal Investigators from these disciplines gender balance has been achieved to a large extent on the student as well as on the faculty level.

³⁴ Being excluded from the faculty by the peer review because of a lack of scientific excellence and an adequate track record is actually affecting both, female as well as male researchers.

students as they hardly see any chance to reach out for the recommended quota on the faculty level.

Overall there is a heterogeneous picture with regard to the possibilities to promote women on the different levels of DK. Here Principal Investigators also mentioned that there is a need to make DK positions more family friendly to support the promotion of females in DK and requested information on good practices how to promote women pursuing an academic career while simultaneously having a family. Indeed, it is evident that pregnancy is still a challenging issue for the management of DK and there are currently no recommendations by the FWF about the best way to support doctoral candidates with family responsibilities.

5.2 Studying in a Doktoratskollegs from the perspective of representatives of doctoral candidates and the representatives of doctoral service centres

To gain insight in the opinions of doctoral students about the significance of DK interviews with the national association of doctoral candidates³⁵ and representatives of centers of doctoral studies established at the Austrian universities have been conducted. These interviews provide information on experiences of doctoral students in DK and the perception of DK by doctoral students.

One of the hot topics currently discussed as regards doctoral training in Austria is the lack of funding for doctoral positions, fellowships and also for the support of doctoral training at Austrian universities. In this respect the DK are perceived as an important funding instrument by the representative of the national student association as they provide the opportunity to become employed at university during doctoral studies. In particular the opportunity to become employed at university is rated as an attractive asset of the DK Programme as it provides besides social benefits also an excellent environment to pursue an academic career.

However, from the student representative's point of view DK are seen as highly specialised research and training units that are attractive especially for those students who aim to pursue an academic career. The high specialisation and the interdisciplinary approach are the key assets which distinguish DK from other PhD programmes implemented at the universities. As a more critical point the representative of the association of doctoral studies mentioned that becoming a member of a FWF DK is in singular cases difficult for Austrian students because of the strong internationalisation approach of the DK. There are a few Austrian students who state that they are in a more difficult starting position compared to the international students. However, from the view of the student representative there are no problems with the two different statuses of doctoral students (internal and associated doctoral candidates) as both enjoy the right to participate in the training programme of the DK, both have access to the research infrastructure and both are generally well integrated in the DK's collaboration network.

As regards the funding duration of the doctoral candidates also the representative of doctoral candidates and the representatives of doctoral service centres at universities addressed that in most disciplines only a minority of doctoral students completes their doctoral studies within three years. Here it was indicated that to the knowledge of the interview partners the actual time to the doctoral degree is around four years. The interview partners also indicated that structural doctoral programmes take more time and effort compared to doctoral training outside structural setting as doctoral candidates have to spend some extra time on integrating in an interdisciplinary approach, high level research training and collaborative projects. In this respect it has to be

³⁵ The national association of doctoral candidates (doktorat.at) was asked to take part in the evaluation study as it collected experiences from doctoral students that participate in a DK and from doctoral students who are trained outside DK. Within a telephone interview a representative of doktorat.at. shared these experiences with us. The evaluation team acknowledges the efforts of doktorat.at. Nonetheless, it has to be noted that the experiences collected by doktorat.at used in this chapter are not representative for all doctoral students in Austria but provide an expert insight in current issues in doctoral training in Austria.

mentioned that some DK already reacted to these problems and lowered their requirements as regards the interdisciplinarity of the research approach to enhance the timely completion of research projects.

As regards the internationalisation approach of the FWF DK Programme the interview partners were also critical about the benefits of long research stays abroad. Likewise the Principal Investigators these interview partners pointed out that they find international contacts and short research stays abroad to be valuable internationalisation activities as well.

The representative of the national association of doctoral students indicated that many doctoral candidates leave the DK without having completed their PhD. The interview stated here that for most doctoral students the three year funding period would be too short to complete their thesis and that they have to look for other funding sources to complete their study. As this funding might include employment for other research projects, these doctoral students often become distracted from the completion of their thesis. Recent observations by the national association of doctoral students also found that more and more doctoral students are recommended to take a sabbatical for the completion of their PhD study. This is however not a common practice but differs by university, discipline and faculty members involved in doctoral training. Another issue referred to was the special situation of women in DK, especially the missing support in creating more family friendly working conditions in the DK.

With regard to later careers the representative of the national association of doctoral students and the centers for doctoral services mentioned that the transition to the labour market also forms a challenge for the DK graduates. The chances to find a job depend on the performance of the DK, i.e. its visibility and whether the Principal Investigator is an internationally renown researcher are decisive. Likewise the Principal Investigators also this group of interviewees reports that most DK graduates pursue an academic career abroad because postdoc positions at Austrian universities are rare and the academic labour market in Austria is very tight.

5.3 Embeddedness of Doktoratskollegs

Generally, the DK are seen as well embedded in the research environment, the training and education of their host universities. Here it was reported that the DK also contribute to the teaching at the universities: Lectures are mostly open for non-DK students; courses in transferable skills are partly open, whereas seminars and 'hands-on-trainings' are mostly offered only to the doctoral candidates of the DK. In addition to that, according to the FWF DK Programme guidelines most of the DK are established in cooperation with large-scale research programmes; i.e. DK are built up in prospective fields of research that are part of the strategic planning of the university. In this aspect these fields of research are also often defined as 'fields of excellence'.

Hence, most of the DK are established in research fields where universities have already built up competence and allocate resources as for instance by the FWF Special Research Programs (SFBs). The Special Research Programs play an important role as they provide additional sources for the DK. In particular with regard to the postdoc positions which are explicitly not funded by the DK Programme the SFBs offer some opportunities. Here the Principal Investigators also reported that the Christian Doppler Laboratories (CD Laboratories) are important collaboration partners. These laboratories focus on application-oriented basic research and foster in particular the promotion of science and business cooperation. It was mentioned that researchers from the DK and people from CD Laboratories often work together to exchange scientific knowledge from different thematic fields. However, both programmes - the SFB and the CD Laboratories play an important role for the DK as they offer the opportunity to include postdocs in the DK who can provide some support in the research training of the DK doctoral candidates. According to the interviewees collaboration with the Austrian flagship

initiative COMET (Competence Centres for Excellent Technologies) seems to be not established/common so far. In the view of the Principal Investigators this might be because the COMET Programme is mainly focused on applied research and development, driven by the demand of industry and companies so that the aims of the DK and the COMET Programme have not much in common.

Altogether the embeddedness of DK in the teaching and research environment of their host institutions works well. It gets enforced by the strategic planning of the university and by the collaboration with large-scale research programmes like SFBs and CD Laboratories. In addition to that, the openness of parts of the training programme to other students has to be mentioned. All these approaches support the building of critical mass in specific research fields and foster visibility of the DK and their host institutions.

5.4 Doktoratskollegs in the light of activities and initiatives in doctoral training at Austrian universities

5.4.1 Significance of the DK for recent developments in doctoral training at Austrian universities

In line with the Bologna developments and the amendment of the Universities Act 2002 in 2009 the curricula for doctoral/PhD studies have changed in the recent past.³⁶ The universities have responded to these developments by implementing new curricula for the doctoral/PhD studies that establish doctoral studies as a third study cycle.³⁷ When implementing these changes some universities also established working groups that focus on the improvement of doctoral programmes at their university, in particular on improving the research training and the research environment for doctoral students. The experiences made in the DK play a pivotal role for these reforms and Principal Investigators of DK are frequently invited to take part in the strategic planning for the set up of new structures in doctoral training. Also at some universities handbooks on doctoral training were written for which experiences made in DK were seen as major input and new functions at the level of the university management were created as for instance, the director of doctoral studies.

In Appendix III and IV an overview of recent activities and initiatives to reform doctoral training that have already been implemented at or are currently planned by the Austrian universities are presented. Among these initiatives the implementation of structural doctoral training as PhD studies plays an important role. Here the University of Vienna can be regarded as a front runner in the enhancement of structural doctoral training as it implemented the so-called '*Initiativkollegs*' to support potential applications for the FWF DK Programme. However, experiences show that the success of these *Initiativkollegs* was limited as just a minority of them applied successfully for a FWF DK. That is also the main reason why the University of Vienna has recently decided to stop the calls for *Initiativkollegs* and implemented two other funding schemes for doctoral training in the future. From these one funding scheme, the 'Vienna Doctoral Academies' (VDA), aims to support an interdisciplinary group of doctoral candidates that will work in a prospective research field. This scheme will be implemented by the winter term 2014/2015 and will follow a bottom-up approach. The goal of the *Vienna Doctoral Academies* is to offer a programme that aims to support the socialisation processes of the doctoral candidate in the scientific community (with a special focus on interdisciplinary research) and support doctoral students in becoming independent researchers.³⁸ This latter goal also forms the starting point for the implementation of the second funding scheme called '*uni:docs*' implemented in 2013. With the *uni:docs* scheme the University of Vienna aims to support outstanding individuals to enhance their creativity and

³⁶ Most important as a doctoral/PhD study must take a minimum duration of three years in Austria (see also chapter 1).

³⁷ The following chapter aims to give an overview of recent activities and initiatives set by the Austrian universities in doctoral training. However, this chapter does not aim to fulfill the requirement to cover all aspects and issues of the activities/initiatives set.

³⁸ For more information see <http://forschung.univie.ac.at/vda/>.

independence. For this purpose the *uni:docs* scheme has been established as a fellowship programme for doctoral candidates that provide funding for excellent doctoral candidates for a period of three years. The fellowship aims to enable doctoral candidates to focus exclusively on their research and make substantial contributions to research.³⁹

Also other universities as the University of Graz and the Graz University of Technology have implemented *Doctoral Schools* to enhance structural doctoral training. To become a member of these *Doctoral Schools* doctoral candidates have to apply by presenting a proposal on their research topic. This policy also functions as an implicit selection procedure that limits access to the doctoral school. Here and also at other Austrian universities the structure of *Doctoral Schools* and the implementation of PhD studies also serve as an instrument to tackle the problems/challenges that are associated with the open access of doctoral studies in Austria. Following this intention, many *Doctoral Schools* just represent a formalisation of doctoral studies. With the term ‘formalisation’ it is referred to the fact that those universities offer the curriculum of doctoral/PhD study without big changes in the curricula or the form of doctoral training.

In fact, the funding of doctoral positions within *Doctoral Schools* is handled quite differently by Austrian universities. There are some universities (e.g. University of Vienna, University of Salzburg or University of Veterinary Medicine Vienna) that provide funding for the employment of doctoral candidates, sometimes just 50% positions get funded; other universities do not provide funding for doctoral positions within their implemented *Doctoral Colleges* as for instance the Alpen-Adria-Universität Klagenfurt. Again other universities (e.g. Medical University of Vienna) aim to provide funding for extra doctoral positions attached to the FWF DK or even to extend the employment of doctoral candidates at the university after being funded by the FWF DK Programme (e.g. Vienna University of Economics and Business).

A special case are the Medical Universities as these were required to set up a completely new structured curriculum for the PhD study to correspond to the Bologna structure. According to that all Medical Universities in Austria have already set up PhD Programmes. The Medical University of Graz thereby introduced the first PhD Programme that was externally accredited. Also the Medical University of Graz showed big efforts to implement *Doctoral Schools* according to the guidelines of the FWF DK Programme. Here the FWF has also overtaken the quality assurance of these *Doctoral Schools*.

5.4.2 Doktoratskollegs from the perspective of the university management

In the view of the university management the FWF Doctoral Programme is an excellence scheme which implies that those researchers who applied successfully for a DK can be regarded as excellent or top level researchers as their success proves that they belong to the ‘best’ in their field of science. Representatives of the university management also reported that they appreciate the high level of quality assurance by the FWF as they are not able to provide such a procedure. Accordingly, all universities under review appreciate that the FWF engages in the funding of large-scale projects like the DK, given the high level of quality assurance and the essential need for funds for early stage researchers.

Moreover, representatives of the university management pointed out that the funding decision made by the FWF also justifies to support the DK by additional means from the university’s global budget. These means mostly comprise funding for additional positions (on the doctoral or postdoc level, administrative staff) and the provision of infrastructure (rooms, access to laboratories, technical equipment etc.). Altogether the representatives of universities are convinced that their commitment to the DK is generous, in particular with

³⁹ For more information see <http://doktorat.univie.ac.at/en/funding-for-doctoral-candidates/unidocs-fellowship-programme/>.

regard to the fact that the FWF does not pay any overhead costs for the DK and that universities have to deal with considerable budget constraints. According to that the implementation of DK is also regarded as quite expensive from the view of the university management and has to be taken into account in the strategic planning.

For a few universities it was reported that they try to fund some of the projects of non-successful applications for a DK by means of their global budget. However, there are constraints how much of the activities can be overtaken by the university, here it was reported that most universities can just raise a maximum of about a third of the budget that would have been funded by the FWF. Also there are some other constraints as universities usually do not overtake the costs for the position of the Coordinator or any other administrative support, limit travel expenses and do not provide funds for activities such as student exchange, guest lectures, summer schools or stays abroad.

To date there are no experiences how universities deal with DK that have been funded for the maximum period of 12 years. However, there is consensus among Principal Investigators and Rectors and Vice-Rectors as well that it is essential to fund new ideas in the respective field of research or to invest in completely new areas of research. Thus, after 12 years of funding there should be room to reorient and to focus on new topics and fields.

Altogether the FWF DK Programme is regarded as highly competitive and well administrated by the FWF. Some universities have also already tried to copy the funding scheme of the DK Programme as they have implemented own initiatives for the enhancement of structural doctoral training. However, these initiatives are not as successful as the DK Programme because they lack critical mass and financial means. In this context the FWF DK Programme is also seen an essential funding scheme that completes the global budget of the university by providing additional means for excellent researchers and research projects. With respect to other funding schemes the FWF DK Programme thus takes a complementary role as the initiatives and activities implemented by the universities do not reach the aims in similar way as the DK do, in particular with regard to visibility. Thus, in the view of Rectors and Vice-Rectors it is absolutely necessary to continue the FWF DK Programme; moreover there is even the claim to expand it, to fund more positions for doctoral candidates in the future.

5.5 The added value of Doktoratskollegs

Looking on the different perspectives the added value of the FWF DK Programme is evident. Thus, from the perspective of the Principal Investigators the DK Programme is essential as it provides considerable means of funding for long-term research, following a bottom-up approach. It is in particular the prospect of being funded for 12 years that motivates researchers to apply for a DK. In addition, the DK Programme provides assets as it supports international recruitment of doctoral candidates and enhances the implementation of innovative training elements. Also the team building on the level of the faculty as well as on the level of students working together on a prospective field of research and in doctoral training is a major driving force of DK. These aspects get reinforced by the possibility to test new forms of collaboration, mostly realised in an interdisciplinary approach.

Usually, DK are established in an environment where they benefit from sources and competences of large-scale research programmes like the Special Research Programs. To create critical mass DK are open as associated doctoral candidates are fully integrated and also other interested PhD students can participate in parts of the study programme. DK are also able to build up visibility. The visibility of the DK increases the longer the DK exist. Apparently, the visibility of the DK is also supported by the reputation of the host university; i.e. the higher the reputation of the host university is the more attractive is the DK for researchers and students.

For doctoral candidates it is essential to receive funding for their research projects. Moreover, for many doctoral students it is essential to have an employment, to have a position at the university in order to be integrated in the research environment and to build up contacts with the scientific community. In addition to that collaborations with research partners and spending research stays abroad support a research career after having completed the PhD study. Overall DK graduates seem to be well prepared for the international academic job market.

The impact of the FWF DK Programme on the doctoral training in Austria in general depends on the discipline. It is evident that DK that are established in the Life Sciences go along quite well with the doctoral training culture in this field. This is also partly true in the field of Natural and Technical Sciences where the change towards structural doctoral training seems to be mainly dependent on the department and the people involved. However, for the Social Sciences and Humanities it becomes clear that within DK a new form of doctoral training has been implemented. Unfortunately this has not trickled down to doctoral training outside the DK: here the master-apprenticeship model is still prevalent.

From the view of the university management the FWF DK Programme is an important vehicle to fund excellent research and bright doctoral candidates. It is a complementary scheme to the Austrian universities' initiatives and activities to improve research training that aims to build up critical mass and raise visibility of the researchers and the host institution as well.

Altogether the FWF DK Programme is regarded as excellence scheme from the view of the high-level researchers as well as from the view of the university management that gets enhanced by the high quality assurance of the FWF.

6 Experiences from other countries: international comparison of structural doctoral programmes

The missions of the FWF Doctoral Programme – to contribute practically to the training of excellent young researchers, to establish excellent research at Austrian universities and the policy mission to support the general implementation of high quality doctoral training - will build the cornerstones for the international comparison. The comparison will try to map where the FWF Doctoral Programme currently stands in the European landscape of doctoral funding and training. Here in particular the implementation of the programme, its outcomes and its significance for the further development of doctoral training will be analysed.

Thus, the international comparison of the FWF Doctoral Programme aims at the following goals:

- *Implementation*: What is the specificity of the FWF Doctoral Programme? To analyse the specificity of the implementation of the FWF Doctoral Programme it will be compared as regards some procedural aspects, the scope of the scheme as regards the country context and the coverage of the student body. Finally, the main focus of the funding schemes will be analysed.
- *Output*: Where is the FWF Doctoral Programme positioned as regards the outputs produced by the DK? For this research question we will mainly focus on the achievements of the funding schemes. As far as data is available we will compare the output of the programmes. Among these outputs are the number of graduates, the graduation rate and the time to degree.
- *Significance*: What is the significance of the FWF Doctoral Programme as regards its significance for the reform of doctoral training? Here the programmes will be analysed as regards the question to what extent they have contributed to a reform of doctoral training in the respective country. To answer this research question also the country context and the influence of other groups and stakeholders have to be considered.

Methodology

Several European countries have been included as case studies in the international comparison. According to the proposal funding programmes for doctoral training have been selected that are administered by national research councils and have implemented to some extent instruments for doctoral training that are comparable to those of the FWF Doctoral Programme.

Case studies

To compare the FWF DK Programme we have selected the following programmes:

- The Netherlands: Graduate Programme of the Netherlands Organisation for Scientific Research (NWO)
- Germany: Research Training Groups of the German Research Foundation
- Finland: Graduate Schools of the Academy of Finland
- Denmark: Graduate Programme of the Danish Ministry for Education
- Switzerland: Pro-Doc-SNF/CRUS (funding programme of the Swiss National Foundation/Conference des Recteurs Universités Suisse)
- Norway: National Research Schools of the Research Council of Norway

Some of these programmes are not in place anymore (Pro-Doc/Switzerland, Graduate Schools of the Academy of Finland) or do not play an essential role in the doctoral training for the country under review (Denmark). It

has also become clear that in some countries after an evaluation of doctoral training either on the national level or as regards the funding scheme the national policy regimes for doctoral training have changed (Finland).

Consequently, these changes affect the time frame and the unit of analysis that will be used in the comparison done by this study:

- *Time frame*: Sticking to the original plan, i.e. comparing the programmes listed above with the FWF Doctoral Programme, might lead to some asynchronicity. For those programmes that are not in place anymore current results of the FWF Doctoral Programme would be compared to results that are related to an earlier time period (e.g. outputs achieved by the programme already in 2007). Also positioning the FWF Doctoral Programme in the current landscape of doctoral funding would not be possible. To avoid these asynchronicities the evaluation team decided to investigate the national policy of doctoral training (including aspects of funding) and the developments that have led to the change in the policy and funding for those countries where the funding scheme has been changing.
- *Unit of analysis*: The changes also implicate that the comparison is built on different units of analysis. On the one hand we will consider funding schemes and investigate their effects; on the other hand we will investigate policies on the national level.

The international comparison is mainly based on the analysis of documents. In addition to that expert interviews with representatives from funding organisations and other stakeholders in doctoral training have been conducted. The list of interview partners is attached in the Appendix II.

6.1 Description of the doctoral training and funding programmes in countries selected for the comparison

6.1.1 The Netherlands: Graduate Programme of the NWO

Doctoral training in the Netherlands

Doctoral training in the Netherlands takes place in traditional master-apprenticeship settings as well as in structural forms. Doctoral training is not regulated by a special law; i.e. universities are responsible for the regulation of doctoral training. For the structural doctoral training two major forms can be distinguished: the *National Research Schools* that are operated by a network of universities and the *Research Schools* at the level of the universities. The *National Research Schools* were already implemented in the late 1980s. Sonneveld et al. (2010) identify them as a first stage of structural doctoral training in the Netherlands. These *National Research Schools* are mostly disciplinary and they represent a collaborative effort of a network of universities, some of them are offered by professional associations. *National Research Schools* mostly engage in course work, e.g. methods training or specific courses on themes relevant for the discipline. Some of the *National Research Schools* offer a course programme for the whole period of the doctoral study, others intend to complement the doctoral training that takes place at the university. For doctoral students participation in the *National Research Schools* is voluntarily. *Research Schools* at university level were mostly introduced after the implementation of the BA/MA structure in 2005. Since 2009 universities are actively setting up *Research Schools* at the university level, the introduction of performance contracts between the universities and the Ministry in 2012 has given additional importance to doctoral education. While the *Research Schools* at university level are of increasing importance the *National Research Schools* are still active and ongoing.

For the Netherlands two types of doctoral students can be distinguished: first, those students being employed as a research assistant at university and working on a research project related to their PhD.⁴⁰ Second, the so-called external students, those students who are employed in a different setting and work alongside their PhD.

The funding for doctoral training comes from different sources. Most of the students who are working on a research project at a university are funded by the money from the research project. This funding mostly covers the costs for the salary, the costs for the research and some travel costs. Further doctoral training is funded by a premium system, i.e. universities pay a premium to those institutes, research groups or departments that have supervised the doctoral student upon the successful completion of the doctoral degree.⁴¹ This premium is intended to cover the costs for the supervision of the doctoral students or other costs related to doctoral education. Finally, for some students, in particular for external students universities charge tuition fees.⁴²

In the Netherlands the VSNU (the Association of Dutch Universities) collects data on the number of doctoral students and doctoral graduates. In the recent years the number of doctoral candidates has been increasing. While in 2004 about 1,907 doctoral candidates started their study, these were about 2,647 first year doctoral candidates in 2012.⁴³ Also the number of graduates has been increasing. While in the academic year 2002/2003 about 2,568 students have been graduating, these were 4,321 in the academic year 2012/2013.⁴⁴

NWO Graduate Programme

The *NWO Graduate Programme* is a funding scheme especially dedicated to very talented young researchers. It mostly addresses excellent young researchers who are interested in an academic career. Here the programme aims to implement excellent research and training conditions for these young researchers. To achieve these excellent conditions the programme recommends to model some parts of doctoral training as it is done in U.S.-American graduate schools (NWO, 2013, p. 7). Here the programme aims at supporting the further reform of doctoral training respectively the further implementation of graduate schools at Dutch universities.

The programme funds research groups with up to four doctoral students who are working on a common research topic. A group of professors has to apply for the funding at the NWO. The funding covers the salary costs for the doctoral candidates and research costs that are related to the project. The university has to provide an organisational structure for doctoral education and provide the funding for it. The funded projects run for four years. Though the doctoral candidates are supposed to do a research project that is related to the common research theme the programme aims at allowing the candidates a maximum of freedom of choice to design their research question and to choose their supervisor. A further goal of the programme is to achieve the best match between a doctoral student and his/her supervisor. Therefore the selection for the fellowship already starts during the Master phase of the study. Then students are pre-selected for the programme and work together with different supervisors for their Master thesis on a rotational basis. From those students the most talented will be offered a fellowship, they can then choose with whom they would like to collaborate on

⁴⁰ These research assistants are mostly called AiO (Assistent in Opleiding) which could be translated with research trainees.

⁴¹ The funding by premiums clearly differs from the lump sum funding that prevails in the Scandinavian countries. The lump sum covers costs for doctoral training already in advance and for all current doctoral candidates. Receiving the funding is not dependent on the successful completion of an individual doctoral degree though the number of completed doctoral degrees in the past might be considered in the calculation of the lump sum.

⁴² See also Vossensteyn, 2011.

⁴³ The numbers on the doctoral candidates only represent the doctoral candidates in the first year of study who are employed at a Dutch university or at a medical centre that belongs to a Dutch university that is reporting to the VSNU about their doctoral training. These numbers do not include the doctoral candidates who are doing their PhD in a different setting. Unfortunately, it cannot be estimated to what extent these doctoral candidates represent the whole population of doctoral candidates in the Netherlands. In a study on the recent doctoral degree awardees from four universities in the Netherlands about 23% of the respondents were external candidates, about 71% were employed at universities (see Sonneveld et al., 2010).

⁴⁴ These numbers were provided by the Dutch Statistical office
<http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLNL&PA=71247ned&LA=NL> (accessed on March 17th, 2014).

their doctoral thesis; students can also determine their research projects freely within the scope of the research theme of the group.

A recent evaluation (NWO, 2013) of the NWO Graduate Programme reveals that the programme has been achieving most of the goals that it is aiming for; although to a different extent the programme achieves to implement excellent research and training conditions at graduate schools. The evaluation also highlights that the programme has benefitted from giving more freedom of choice to the doctoral candidates, in particular the inversion of the selection mechanism (here selections are done by the young researchers/doctoral candidates) has contributed to a more conscious selection of research project and supervisor on the side of the doctoral candidates (NWO, 2013, p. 3). The programme has also supported the further implementation of structural doctoral training respectively of graduate schools at some Dutch universities. In particular at those institutions that were already in the process of implementing a graduate school the NWO programme has given an additional impetus to do this as the existing graduate schools have to meet certain requirements to serve as a framework for the NWO Graduate Programme. Though the programme has contributed to a wider acceptance of graduate schools some respondents were critical about its narrow focus: the concentration of funding on only excellent students and the limited time frame of only four years have been valued as a risk for a sustainable implementation of graduate schools (NWO, 2013, p. 5).

6.1.2 Germany: DFG Research Training Groups

Doctoral training in Germany

As doctoral training in Germany is not prescribed by any law either on the national level or on the level of the federal states but left to the regulation of universities and even more faculties and departments there is a multitude of different pathways to the doctoral degree. Doctoral students can either be a research assistant at the university (holding a position funded by the university's global budget or being funded by competitive funds), they can be external students working in a job outside higher education or they can be funded by a fellowship by one of the major research funders in Germany. All these different pathways allow a lot of flexibility in the German system of doctoral training.

The master-apprenticeship model is still prevalent in doctoral training although in the recent years some programmes have been started to implement and enforce structured doctoral training. As Hauss et al. (2012) in their study on the current state of art of doctoral training in Germany show the number of structural elements in the training is still rather low for most of the doctoral candidates. Most prevalent is the form of doctoral training where students have been participating in at least one course within a year of study. Also for a substantial part of doctoral students it is found that their doctoral training does not have any structural element. Hauss et al. (2012) also reveal that participation in a funding scheme which is especially dedicated to structural training does not strongly influence the degree of structuring of doctoral training. As regards supervision the report states that supervision by a single professor is still prevalent for the majority of students but here also differences by the field of study need to be considered. For some disciplines team supervision is more the rule than for others. It is also shown that the kind of supervision is not directly related to the level of structuring of doctoral training, i.e. highly structured programmes do not necessarily have team supervision.

Nonetheless, the trend towards the introduction of structured doctoral training is still very strong in Germany. In the recent past more and more universities have started to implement *Doctoral Schools* and *Research Schools* at the central or faculty level. This development has been especially supported by the nation-wide *Excellence Initiative* and the importance it has given to the implementation of excellent *Graduate Schools*.

As doctoral students at most universities do not have to enroll there are currently only estimates on the number of doctoral candidates in Germany.⁴⁵ A report of the Federal Statistical Office estimates that in the winter term 2010/2011 about 204,000 doctoral students were doing a PhD, the number of officially enrolled students was about 104,000 students (Statistisches Bundesamt, 2012, p. 18ff).⁴⁶ The report also states that in 2010 about 25,600 candidates (including doctorates in law and medicine) completed their degree successfully. Compared to other European countries the number of awarded doctoral degrees have not risen significantly over the last years but remained stable on a level of about 23,000 awarded doctoral degrees (+/- 10%) per year since 1993.

Research Training Groups of the German Research Foundation

The German Research Foundation was one of the pioneers in the implementation and funding of structured doctoral training. In fact the first *Research Training Groups* were implemented in the late 1980s; currently more than 1,000 *Research Training Groups* have been funded. The funding scheme also serves as role model for a number of similar initiatives as for instance, for the Max-Planck-Society or the Hans-Böckler-Foundation.

Research Training Groups are temporary research groups that are located at universities, either at a single institution or a network of universities including international institutions as well as public research institutes. These groups are mostly interdisciplinary and deal with a common research topic that gives the frame for the individual research projects of the doctoral candidates participating in the group. To receive funding a group of professors has to set up a common/overarching research theme for the group and the doctoral training programme. The actual application for the Research Training Group is done by the host university. As a rule, supervision in the *Research Training Group* should take place as team supervision; i.e. doctoral candidates should be supervised by at least two supervisors. The basic funding covers following costs: funding for staff (fellowships and positions) for doctoral and postdoctoral researchers as well as for doctoral researchers in medicine, qualifying fellowships, funding for student assistants, funding for equipment up to 10,000 Euros, software and consumables, travel, visiting researchers, experimental animals, and other expenses such as announcements and recruiting, language training, communication training, presentation training, media training and publications.⁴⁷ In addition to that also funding for 'extra-modules' can be applied for. Besides the doctoral students who receive funding from the German Research Foundation also further doctoral candidates funded by other resources can participate in the *Research Training Groups*. The funding is provided either as employment at universities or as a fellowship. Here the Research Training Groups are free to choose one of the options since 2004. In the recent years the number of Research Training Groups who provide funding as employment has been increasing. In 2008 about 12% of the Research Training Groups applied in their project proposals for the possibility to fund their doctoral students by employment only (DFG, 2012a, p. 18).

Since its implementation in the late 1980s the funding scheme has been changed and amended several times. The most important amendment was the introduction of the *International Research Training Groups*. Here funding is provided for the institutionalisation of research collaboration of German and international universities and research institutes. The *International Research Training Groups* are operating according to a similar framework as the national *Research Training Groups*.⁴⁸

⁴⁵ See for a critique of the current practice Hornbostel et al. (2012).

⁴⁶ These data are based on a survey among a representative sample of professors at German universities who were asked to indicate the number of their doctoral students.

⁴⁷ DFG form 20.07-10/12, p. 9. (DFG, 2012)

⁴⁸ Internationalisation is also important for the national Research Training Groups. Here funds for abroad are provided to the students. The major difference between the national and the international Research Training Groups is that the latter are focusing on the institutionalisation of international research cooperation.

As the programme is already running since the beginning of the 1990s it has achieved a considerable outreach in terms of graduates and doctoral students. Per year approximately 5,000 doctoral students participate in the *Research Training Groups*; further about 5-7% of all doctoral graduates have been a member of a *Research Training Group*.

6.1.3 Switzerland: SUK Doktoratsprogramme

Doctoral training in Switzerland

Doctoral training in Switzerland is offered in structural programmes as well as in the traditional master apprenticeship model. The doctoral education is not regulated by a national law; i.e. the universities are responsible for the doctoral training as they are the only ones that are eligible to award doctoral degrees. Consequently, most universities have established their own doctoral programmes, whereas structural programmes in doctoral training are mostly collaborative programmes that are run by a network of different institutions (Eurypedia, 2013).

A report issued by the Rectors' Conference of the Swiss Universities in 2008 states that doctoral studies are more and more taking place in structured programmes (CRUS, 2008, p. 7) whereas the traditional master-apprenticeship is slightly losing its former importance. However, current statistics do not allow estimating the number of doctoral candidates in the different forms of training. But it is evident that some of the Swiss Universities have already changed completely to structural doctoral training, although the traditional master-apprenticeship model still plays an important role.

In 2012 a total of 22,716 doctoral candidates were enrolled at the Swiss universities; further 3,640 doctoral degrees were awarded in that year. Compared to 1995 when a total number of 2,601 doctoral degrees were awarded, we can note that also in Switzerland the number of awarded doctoral degrees has been increasing in the recent years.

Moving from ProDoc to the SUK-Doktoratsprogramme

The *ProDoc*⁴⁹ funding scheme represented a collaborative effort of the Swiss National Fund (SNF) and the Rectors' Conference of the Swiss Universities (CRUS) running from 2008 till 2011. Before the implementation of this scheme both organisations were engaged in the improvement of doctoral education. The SNF had started the scheme *ProDoc* in 2006 with the major aim to fund research training groups. At the same time the CRUS proclaimed as a strategic goal for the period 2008 till 2011 to standardise doctoral education in Switzerland by implementing around 1,000 doctoral programmes (SUK, 2012, p. 43). For the implementation of these programmes the CRUS applied for so-called 'Projektgebundene Beiträge'⁵⁰ at the Swiss University Conference (SUK) in 2008. The SUK granted the money under the condition that the CRUS and the SNF will coordinate their initiatives. In response to this requirement the SNF and the CRUS handed in a collaborative proposal for the funding of structural doctoral programmes; this collaborative proposal carried the title *Pro-Doc-SNF/CRUS Programme* and was granted by the SUK for the period from 2008 till 2011.

⁴⁹ Besides *ProDoc* also *CUSO* is an important scheme for doctoral training. With *CUSO* universities of the southern/western Cantons of Switzerland invented doctoral programmes as a collaborative effort.

⁵⁰ „Projektgebundene Beiträge“ (PB) are a special funding instrument of the Swiss Federal Government to implement innovations or to fulfil tasks in higher education: „Mit den PB werden Kooperationsprojekte und Innovationen von gesamtschweizerischer Bedeutung unterstützt, die der Bund auch selbst anregen kann und für welche die beteiligten Universitätskantone, Universitäten oder Institutionen grundsätzlich angemessene Eigenleistungen zu erbringen haben“ (Art. 20 und Art. 21, Abs.2 UFG, SR 414.20). „These funds are administered by the Swiss University Conference and are used to implement innovations or cooperative initiatives in Switzerland“ (SUK, 2012, p. 1).

Generally, the *Pro-Doc-SNF/CRUS Programme* was open to all scientific disciplines. Its main goal was to increase the quality of doctoral training in Switzerland as doctoral candidates participating in the programme should have the opportunity to be integrated in the scientific community and to take part in excellent research training. Moreover, doctoral programmes that were funded by this programme had to be run by at least two Swiss universities. They consisted of a training module and a research module which was oriented towards a common scientific research question. At least 12 doctoral candidates had to participate in such a doctoral programme, from these about ten could receive funding for their salary and research. The programme provided also funding for the training module. Two further aims of the programme were to find/organise new ways of funding for doctoral training, in particular for the teaching component; and to identify good practices for doctoral training that have already considered the European developments.

Already before the programme started the SNF had announced that it will withdraw from the direct funding of doctoral education in the medium term. Both partners, the SNF and the CRUS valued the implementation of the programme as difficult as it was aiming at too many different goals. The collaboration of the two different organisations led to some challenges when implementing the programme as both organisations valued different criteria as important for the allocation of funding. The CRUS was more interested in the further reform of the educational component of doctoral training while the SNF was interested in the funding of excellent research. Consequently, the selection of projects for funding was complicated as the projects had to serve very different goals like the innovation of teaching and learning, research as well as strategic innovation of doctoral training simultaneously. By the end of 2012 the CRUS decided to step out of the funding scheme *Pro-Doc-SNF/CRUS*.

Since 2012 the CRUS operates the funding programme *SUK Doktoratsprogramme*; it will run for a first period till 2016.⁵¹ The new funding programme takes a very different approach in funding doctoral training than its forerunner. Its main goal is to strengthen doctoral training, in particular to support universities in implementing inter-institutional doctoral programmes. The funding should be used to develop, implement and run these doctoral programmes. Among the universities that participate the funding is distributed according to a fixed allocation formula: universities receive a fix sum and a variable sum. The latter is related to the number of doctoral candidates and doctoral degrees that have been awarded. There is no competition in the distribution of the money. The universities themselves decide on how they would like to invest the funding. However, the initiatives taken have to meet certain requirements (e.g. the support of inter-institutional collaboration) and the money cannot be used for the funding of doctoral students and their research.

A first survey among Swiss universities shows that universities have been spending the money in various ways. Besides the implementation of new inter-university doctoral programmes also former training programmes that were funded by the *Pro-Doc-SNF/CRUS* programme or the *3ème cycle* of the CUSO (Conférence universitaire de Suisse occidentale) have been continued.

6.1.4 Norway: National Research Schools of the Research Council of Norway

Doctoral training in Norway

Doctoral training is mostly offered in a structured form in Norway. Indeed, general guidelines for the design of doctoral studies are part of the Norwegian higher education law. The law stipulates that doctoral candidates have to earn up to 30 ECTS by course work at the beginning of their study. Within these courses both research

⁵¹ Also the SNF funds doctoral research within various measures. All of them are now primarily oriented towards the funding of research and the salary/fellowship for doctoral candidates. Among these measures are special fellowship programmes for excellent students from the Arts, Humanities and Social Sciences (Doc.CH) or the medical sciences (MD-PHD-Programm).

training and transferable skills training are offered. For admittance to the programme doctoral candidates have to apply to the institutions or faculties. Students also have to demonstrate that they have funding for the period of their doctoral study. The formal length of the doctoral study varies between three and four years depending on the funding of the students. Doctoral candidates who receive a fellowship from their higher education institution mostly study for four years but also have to fulfil teaching and other duties during their fellowship period.

In 2003 the last major reform of doctoral training took place in Norway as doctoral training changed in line with the overarching 'quality reform' in higher education. The most important change of this reform was the replacement of the very different, disciplinary related PhDs by a common PhD. Therefore, the general guidelines for PhD regulations have been set by the Norwegian Association of Higher Education Institutions; also the degree awarding institutions have to be accredited by the NOKUT, the Norwegian quality agency. Within the framework of the guidelines universities and other higher education institutions are autonomous to set up their own detailed regulations for doctoral training that apply to the whole institution. Mostly the faculties tend to provide the contents of doctoral training by setting up doctoral programmes and specialised study plans (NIFU, 2012, p. 18).

In Norway, the numbers of doctoral candidates and degrees awarded have been doubling in the recent ten years. In 2012 about 9,000 doctoral candidates were enrolled in doctoral programmes offered by those higher education institutions that are accredited for doctoral education. Practically, the Norwegian higher education system offers a number of different institutional pathways to the doctorate as not only universities can award doctoral degrees but also university colleges and research institutes that have been accredited for doctoral education by the NOKUT. Currently, about 30% of all doctoral candidates are enrolled in institutions that are not universities. In 2012 about 1,400 doctoral degrees were awarded.

The National Research Schools of the Research Council of Norway

In Norway the term *Research School* refers to a plethora of different forms of doctoral training (NIFU, 2012, p. 39ff). Among these research schools are those which are institutionally funded as well as research schools which are funded by other means, also with funds of the Research Council of Norway. These research schools may operate on the national as well as on the international level, might be bound to a single higher education institution or to a network of different higher education institutions that are collaborating.

When referring to the *National Research Schools* of the Research Council of Norway the research schools are run collaboratively by different institutions and funded within the scheme FORSKERSKOLER (National Research School). The funding scheme was established in 2008 and aims to implement network-based research schools and to complement the research training offered by the higher education institutions. Within the funding programme different Norwegian institutions collaborate to set up doctoral programmes, i.e. they offer courses in research training. The schools differ in the extent of the training offered: while some schools offer complete programmes, others offer a catalogue of courses where doctoral students can select from. The training however does not lead to a doctoral degree; the degree is still conferred by the participating institutions.

This funding scheme was first launched in 2008 after a call of the ministry. For this first call about 27 applications were sent in, from those five applications have received funding for a period of eight years (from the beginning of 2009 till 2016). In a midterm evaluation in 2013 it was decided that the programme should continue for the last three years; this implies that in 2013 all five *National Research Schools* have been prolonged. In 2012 a second call for the *National Research Schools* was announced. Then from a total of 29 applications ten schools have been selected for funding. In total about 115 million NOK (around 13.86 million

Euros) have been granted in the first funding period, increasing to about 218 million NOK (26.28 million Euros) available in the second funding period.⁵²

The programme of the *National Research Schools* was implemented after the ministry had issued a white paper on doctoral education in Norway.⁵³ This paper mainly criticised the lack of efficiency in doctoral training and claimed a shortening of the time-to-degree as well as an increase in completion rates (NIFU, 2012, p. 39ff). As a consequence the *National Research Schools* have responded to this criticism and aim at the following goals:

- Increasing degree completion
- Reducing the time to degree
- Ensuring a broader base for research training
- Strengthening doctoral training in particular research fields
- Increasing the quality of research training in Norway

Funded schools need to have at least 20 doctoral candidates enrolled and four to eight supervisors engaged in the research school. The steering of the research school is done by a scientific director and by a board that is responsible for the development of the scientific programme and the selection of the doctoral candidates. The funding is intended for the organisation and the ongoing activities of the *National Research School*. It does not include funding for fellowships of the doctoral candidates or for their research. According to the call for proposals from 2008 the funding covers the following costs (Research Council of Norway, 2013, p. 40):

- National and international seminars, courses, workshops etc.
- Internationalisation measures
- Measures to support the development of supervisory services
- Compensation for salary costs for time used by the director of the research school (usually up to 30 per cent of one work year per year)
- Secretariat services (usually up to 15 per cent of one work year per year)
- Funding of incorporate postdoctoral fellows in the research school (up to 50 per cent of one work year for the extension of the postdoctoral period)

6.1.5 Finland: Doctoral Programmes of the Academy of Finland

Doctoral training in Finland

At the beginning of 2010 a new higher education law that grants legal autonomy to universities has been implemented in Finland. With the new higher education law also doctoral training was reformed. The law obliged universities to implement an organisational framework for doctoral training as most universities did not have an encompassing training structure for their doctoral students. There were also graduate schools that were funded by the Ministry of Education and administered by the Academy of Finland that were operating on the national level. These were only attended by 10% of the doctoral candidates (Ministry of Culture and Education Finland, 2012, p. 36). In addition, most universities had only a rough overview of their doctoral students as students did not have to enroll for doctoral studies. Overall, the doctoral training was evaluated as inefficient as the time to degree was regarded as being too long. Also the training leading to the doctoral degree was often considered as the actual research career rather than the start of it (Academy of Finland, 2011, p. 4).

⁵² Indication of Euros is based on current exchange rates.

⁵³ As stated by the website of the programme, see http://www.forskningsradet.no/prognett-forskingskoler/About_the_programme/1224066964170.

The reform of doctoral training was based on recommendations of a working group that was in charge with the evaluation of the Finnish graduate school programme structure (Academy of Finland, 2011). The reform builds on the following cornerstones:

- Since the beginning of 2012, all universities are expected to provide an organisational framework for doctoral training. The universities are free to design these structures according to their needs.
- All doctoral candidates have to be included in the organisational framework.
- The budget for doctoral training is included in the lump sum funding of the universities. The amount is based on the total number of doctoral degrees awarded each year. Universities can autonomously decide on the allocation of this money. They are free to determine the number of doctoral students and the kind of doctoral studies they fund. This implies also that fellowships for doctoral students are now announced and distributed by the universities.

One of the main goals of the reform is to achieve more transparency and predictability in doctoral training. However, to date it is too early to evaluate the overall effects of the reform, but some actors state that doctoral studies have become more distinctive at Finnish universities. Also students have become more aware of their role and status and appreciate the clear structure of doctoral studies.

In 2012 a total of 18,867 doctoral students were enrolled at Finnish universities. Further, 1,655 doctoral degrees were awarded in this year. Over the years Finland has faced a stable development in the number of awarded doctoral degrees: between 2002 and 2012 about 1,900 degrees were awarded each year (Statistics Finland).⁵⁴

Programme of the Academy of Finland

The doctoral programme funded by the Finnish Ministry of Education and administered by the Academy of Finland stopped in 2011. Its main goal was to increase the quality and efficiency of doctoral training. Within the scheme disciplinary and interdisciplinary research schools offered training for doctoral students. Most of the research schools operated at the national level to build up a critical mass of doctoral students in some research areas and disciplines. The programme also intended to complement the training done by universities.

An evaluation of the programme undertaken by a working group concluded that the programme did not contribute to an increase in the efficiency of doctoral training; the evaluation also found that only 10% of the students were covered by the programme, and that the interest of the students in the programme was quite low (Academy of Finland, 2011). Therefore the programme was stopped.

6.1.6 Denmark

Doctoral training in Denmark

Doctoral training in Denmark has undergone several reforms in the recent years. A major reform took place in 2007 when it was stipulated by law that all doctoral students have to be admitted to a doctoral school at their university. This regulation did not only affect students but also higher education institutions that were then obliged to implement graduate schools. Before 2007 there were already some doctoral schools implemented but these were only small, mostly located at the faculty level and did not achieve a critical mass of students. With the obligation of higher education institutions to implement a common framework for doctoral training a significant change took place. The number of research schools at universities has been reduced, as initiatives

⁵⁴ See Statistics Finland, download: http://pxweb2.stat.fi/sahkoiset_julkaisut/vuosikirja2013/html/engl0003.htm.

were moved from the faculty level to the central level of universities. In some disciplines universities collaborated and have set up so-called ‘networked doctoral schools’ that are related to a specific topic. Besides the obligation to implement an organisational framework for doctoral training the law also stated detailed regulations on the contents of PhD programmes, supervision, admission and completion. Within these regulations higher education institutions are autonomous to design their individual doctoral training.

Generally, the funding of the doctoral schools and the doctoral training is included in the lump sum funding of higher education institutions. It is up to the higher education institutions to decide how they fund doctoral training, in particular to what extent they would like to fund grants for doctoral students. Another source for the funding of doctoral training is research grants. Within some funding schemes it is prescribed that about 25 percent of the project budget should be dedicated to doctoral training, in particular to the salary of doctoral candidates. Also the collaboration with industry plays an important role in the funding of doctorates in Denmark. The industrial PhD program funded by the Danish Ministry for Science, Innovation and Higher Education provides subsidies to companies which employ doctoral candidates and collaborate with universities in a research project where also the doctoral student is involved.⁵⁵

According to the law doctoral training is organised as structured doctoral training. Universities decide on the design of the curriculum for the doctoral programmes. These curricula have to comply with the requirements stipulated by law. These requirements are for instance to carry out independent research, to earn approx. 30 ECTS in course work and to spend some time at a different (national or international) institution or organisation. The law also requires that doctoral candidates are supervised by a principal supervisor (Danish Ministry – law, § 7-8). Altogether the reformed legislation has led to a major change in the perception of doctoral training. Currently, doctoral training is perceived as part of the education and training, not mainly as research work.⁵⁶

In 2012 a total of 2,421 doctoral students were enrolled at Danish higher education institutions, in the same year a total of 1,627 PhDs graduated. It is evident that the number of PhDs has considerably increased since the late 1990s. In fact, in 1996 just 1,119 doctoral candidates were enrolled and about 696 PhDs graduated.⁵⁷ This increase is due to a steep increase in the numbers of international doctoral students.

Special funding programmes

Besides the funding scheme for industrial programmes there are currently no funding schemes that are particularly dedicated to the education/training of doctoral candidates. Indeed, the costs for doctoral training are mostly covered by the lump-sum funding for the universities and by the funding for research projects dedicated to doctoral training.

6.1.7 Some country based evidences

So far the overview of countries and funding programmes reveals that there are two different approaches in organising and funding doctoral education/training. On the one hand there are countries that provide a legislative framework for doctoral training. Here mostly the higher education law represents the framework for doctoral training that has to be considered by the universities when setting up their doctoral study programmes. Legislation on doctoral education thereby mostly sets rules on the length and form of doctoral

⁵⁵ More detailed information on this funding scheme is provided by the Ministry’s website: <http://fivu.dk/en/research-and-innovation/funding-programmes-for-research-and-innovation/find-danish-funding-programmes/postgraduates-in-the-private-sector/industrial-phd>.

⁵⁶ As stated by one of the interview partners.

⁵⁷ All data are retrieved from the website of the Danish statistical office (Statistik Denmark).

study, and it obliges universities to implement an organisational framework for doctoral education like a graduate or a research school. This kind of pathway is mostly found in the Scandinavian countries as in our sample in Denmark, Norway and Finland. This strategy is mostly accompanied by lump sum funding for doctoral training. Here the funding mostly covers the costs of the training. Staff costs of doctoral candidates are mostly funded by other sources, in particular by funds for research projects. Norway even complements this funding for the educational part of doctoral training with the programme *National Research Schools*. Given these evidences, we define this approach in doctoral training as ‘education oriented’ or programmes that aim to improve doctoral education.

For the other countries (Germany, Switzerland and the Netherlands) under review it becomes clear that there is no legislative framework for the doctoral training; here universities or even faculties autonomously decide on the form of doctoral education. Research schools are established at the level of universities or by networks of universities although there is mostly no legal obligation for the higher education institutions to implement these structures. In line with this there is also no obligation for doctoral candidates to enroll in a doctoral programme or research school. Thus, in these countries there are different pathways to do a PhD study. This is also reflected by the different ways of funding in doctoral training that comes from different sources and finances different aspects of the training. In the funding schemes/programmes analysed mostly both training costs as well as costs for research and staff are covered. Funding schemes also have a multitude of different goals: while the funding of excellent research and excellent young researchers is the most important goal, the programmes sometimes also aim to foster innovative doctoral training, in particular by the implementation of structured doctoral training. Given these evidences and because of the programmes’ main focus is on research, we define this approach in doctoral training as ‘research oriented’ or fully fledged programmes.

In the international comparison among the countries reviewed Switzerland takes a hybrid position. Here a legislative framework for doctoral training does not exist either. But – after having had a more research oriented funding of doctoral training (though this only funded a minority of doctoral candidates) - Switzerland introduced the *SUK Doktoratsprogramme* – a more education oriented funding programme.

Table 7: Overview and classification of compared programmes/countries

Country/Funding programme	Period	Main funder	Distribution/Management of the funding programme	Goals of the funding programme	Costs covered	Classification of the funding programme
Norway National Research Schools of the Research Council of Norway FORSKERSKOLER	1 st funding period 2009-2016 Midterm evaluation in 2013	Norwegian Ministry of Education and Research	Research Council of Norway	<ul style="list-style-type: none"> - complement the doctoral training at Norwegian higher education institutions - provide excellent research training - achieve critical mass of doctoral candidates in some areas 	<ul style="list-style-type: none"> - administrative costs of the doctoral training - salary for teachers in the programme - mobility funds for students participating in the offer 	education oriented
Finland Doctoral Programmes of the Finnish Academy	stopped in 2011 after evaluation: only low coverage of students, no impact on efficiency in doctoral training	Finnish Ministry of Education	Academy of Finland	<ul style="list-style-type: none"> - complement doctoral training at Finnish universities - achieve critical mass of students for training - provide excellent research training - improve efficiency of doctoral training 	<ul style="list-style-type: none"> - costs for setting up high-level educational programmes - costs for cooperation among national and international higher education institutions 	education oriented
Switzerland Pro-Doc SNF/CRUS	operated between 2006 and 2011	SUK	SNF/CRUS	<ul style="list-style-type: none"> - funding of excellent young researchers - funding of excellent research - impetus for the further development of doctoral training in Switzerland 	<ul style="list-style-type: none"> - costs for research, including staff costs/scholarships for doctoral candidates - costs for training 	research oriented
Switzerland SUK Doktoratsprogramme	since 2012	SUK	CRUS	<ul style="list-style-type: none"> - improving the quality of doctoral education in Switzerland - increase the collaboration of Swiss universities in doctoral education 	<ul style="list-style-type: none"> - costs for measures/instruments/projects at Swiss universities to improve the quality of doctoral education 	education oriented

Germany Research Training Groups	since late 1980s	DFG	DFG	- funding of excellent research - funding of talented young researchers	- staff costs - research costs - administrative costs - travel costs	research oriented
The Netherlands NWO Graduate Programme	since 2010	now	NWO	- high quality training for the most excellent doctoral training (interested in an academic career)	- staff costs - travel costs - research costs (universities are obliged to offer a framework/school for doctoral education)	research oriented
Denmark no special funding scheme		Ministry for Science, Innovation and Higher Education	n.a.	n.a.	lump sum funding for doctoral training, universities decide on the funding	education oriented

Source: IHS – CHEPS - AIT

6.2 Implementation of the programmes

To analyse the specificity of the implementation of the FWF Doctoral Programme it will be compared with the other programmes of European countries under review, especially with regard to some selected procedural aspects. The international comparison shows that there are different approaches and ways to organise doctoral training and fund doctoral students. In this respect we aim to investigate how well the implementation of the FWF DK Programme works. In the following we will look on a selective list of indicators (see also chapter 3). These are:

- Selection of doctoral candidates for the funding programme/scheme
- Organisation of the supervision
- International orientation

6.2.1 Selection of doctoral candidates for the funding programme/scheme

Within the framework of the study we are not able to provide detailed information on the organisation of the selection process. Instead we investigate some general aspects in order to classify and categorise different forms of selection processes. The main variable for this categorisation is the degree of openness in the selection procedure. Here we assume that this variable refers to different forms of access to the funding scheme which are organised on a continuum, from competitive access to open access. Competitive access means that doctoral students have to apply to be included in the doctoral training. In the application and selection procedure they have to meet certain criteria and they are selected by a committee to be included in the doctoral training. Open access refers to funding schemes where doctoral candidates do not have to apply but can freely enrol in the courses or services that are available in the funding scheme. Selection procedures may also vary between these two poles: doctoral candidates for example might have to apply for a service and will be selected as long as places are available - thus they do not have to meet certain selection criteria.

Table 8: Accessibility of doctoral education in funding programmes/schemes

Funding Programme/ Scheme/Country	Description of selection process	Type of selection process
NWO Graduate Programme The Netherlands	The programme targets talented young scientists who are interested in pursuing an academic career in the long run. The core of the funding scheme is that the selection procedure is not oriented towards a certain point in time when doctoral candidates have to apply with a research proposal for a fellowship. Rather, the funding scheme allows prospective doctoral candidates to select among a set of potential supervisors and researchers for their PhD research. Therefore the selection takes already place in the Master cycle of the study process. In this phase the most excellent students are selected as eligible candidates for a later PhD position in the Graduate Programme. During the Master phase students usually start to work on their PhD research. Additionally, in a rotation system different pairs of supervisors and students can be tested to find the best match between student, supervisor and research project. At the end of the Master phase the most talented students will be offered a PhD position in the Graduate Programme.	<i>closed access</i> testing and matching to achieve the most efficient pairs of candidate, supervisor and research project
DFG Research Training Groups Germany	Here doctoral candidates have to apply for the fellowships offered in the Research Training Group. In most groups they have to hand in a research proposal that includes a plan for the research they want to undertake in the Research Training Group. According to the description of the programme the funding scheme aims in particular to support 'excellent' early stage researchers. The description does not provide further eligibility criteria as regards the qualification of prospective doctoral candidates except for the formal qualification and the requirement to commit to gender equality. Consequently, it is left to the individual Research Training Group to determine the selection criteria and the selection	<i>closed and semi-open access</i> - no standardised procedure - status of the doctoral candidates determines the selection procedure

	<p>procedure.</p> <p>The Research Training Groups are also open to doctoral candidates who do not receive a fellowship of the DFG. It is left to the individual Research Training Group how the selection of associate members is organised.</p>	<p>- candidates that apply for a DFG-Fellowship have to go through a selection procedure and meet criteria</p> <p>- RTG determine the selection criteria for candidates that apply for an associate membership</p>
ProDoc SUK Doktoratsprogramme Switzerland	<p>The former programme ProDoc enclosed the funding of research as well as the funding of doctoral education. Besides supporting excellent research the funding scheme also aimed to increase the quality of doctoral education in Switzerland. As the accessible data on the ProDoc programme does not provide information on the selection procedure we may just assume from an evaluation report (in total only 3 to 4% of all doctoral candidates in Switzerland participated in ProDoc) that also here a closed access was prevalent.</p> <p>In the current funding a very different approach has been taken. Here funds are only dedicated to support the improvement of doctoral training at Swiss universities. Universities are free to decide how they spend the funds. Here also the general policy of the individual university is important. At those Swiss universities where doctoral training is generally implemented as structured doctoral training, access to the measures funded by the SUK Doktoratsprogramme is open. For those Swiss universities where only some departments or faculties offer doctoral programmes the access is open in the respective departments and faculties, for the other doctoral candidates the access to the measures is limited. For some of the implemented measures as for instance funding of mobility, students also have to apply.</p> <p>Altogether selection of the students takes place in a different setting. However, there is the trend towards more open access.</p>	<p>former ProDoc Programme: closed access</p> <p>current SUK Doktoratsprogramme: trend towards more open access.</p>
National Graduate Schools (Forskingskolen) Norway	<p>The funding of National Graduate Schools (Forskingskolen) mainly aims to complement the current doctoral training at Norwegian higher education institutions. Also the collaboration among higher education institutions should be strengthened by forcing them to set up networks in doctoral education. In the funding programme it is left to the networks whether they want to have open or closed access to their training programmes. According to the midterm evaluation report four out of the five granted National Graduate Schools have chosen an open access model. In the open access model students can select courses and services offered, register for them and participate voluntarily. In the closed access model students have to apply to be admitted to the schools. Once they are admitted the programme is compulsory.</p>	<p>open and closed access</p>
Finland	<p>The former doctoral programmes intended to reach out for the majority of doctoral students. Its main aim was to increase the quality and efficiency of doctoral training in Finland. Therefore, access to the services provided by the doctoral programmes was open as the Ministry of Education, Science and Culture as the main funder attempted to give support for the 'organisation of systematic, high quality and guided doctoral training' (Academy of Finland, 2011, p. 5). This support should contribute to a lowering of the time to degree and an increase in the number of graduates. An evaluation of the programmes showed that only half of the recent graduates participated in the doctoral programmes funded by this scheme; also most of these students only used some of the services provided by the programmes.</p> <p>Thus, to increase the efficiency in doctoral training the funding and legislation of doctoral training has been changed. The former doctoral programmes were stopped. In the current scheme universities receive a lump sum funding for all their activities in the doctoral training. Now every student has to enrol for the doctoral study. At some universities the doctoral students also have to become a member of the graduate school that organises and provides courses for doctoral training. Thus, the selection for doctoral studies takes places in a different setting.</p>	<p>open, compulsory enrolment in doctoral training for new entrants in doctoral education</p>
Denmark	<p>There are individual selection procedures for each research position. Also the enrolment in doctoral schools is compulsory.</p>	<p>open, compulsory enrolment in doctoral training</p>

6.2.2 Organisation of the supervision

As a main characteristic of structural doctoral training mostly an orientation towards team supervision has been identified. The goal is here to share the responsibility for doctoral education by a team; a strong dependency of the doctoral candidate on a single supervisor should be avoided. Sharing responsibility takes very different forms as the day-to-day supervision can be done by a team of supervisors (team supervision) or different committees for supervision and final examination can be organised. In the latter approach mostly a main supervisor is responsible for the day-to-day supervision (divided supervision).

Table 9: Organisation of supervision

Funding programme/ Scheme/Country	Description of the organisation of supervision	Type of supervision
DFG Research Training Groups Germany	The programme intends that doctoral candidates are supervised by a team, i.e. by at least two supervisors. Ideally, team members come from different disciplines to enforce interdisciplinarity. The Research Training Groups can decide how they would like to organise the supervision. Some of the Research Training Groups that are already moving to implement a Graduate/Research School model tend to set up detailed rules on the organisation of supervision, including rules on the frequency of meeting, progress reports of the doctoral candidates and the groups that have to be included in the supervision.	<i>team supervision</i>
NWO Graduate Programme The Netherlands	For the organisation of supervision it is most important to find the perfect match between doctoral candidate, supervisor and research project. By the rotation principle the doctoral candidates can try to work with different supervisors and look for the most appropriate one. The doctoral candidate thus will be mainly supervised by this selected principal supervisor and supported by other experienced researchers. External supervisors are important in the final defence of the thesis (depending on the university's regulations).	<i>divided supervision</i>
National Graduate Schools (Forskingskolen) Norway	Supervision is not part of the funding scheme. Follow-up of the students and supervision take place at the home institutions and are done according to the institutions' regulations. Here students mostly have a principal supervisor and will be examined by different supervisors when defending their thesis.	<i>divided supervision</i>
Finland	In the old funding scheme a special organisation of supervision was not foreseen. Currently, supervision is organised according to the respective regulations of the higher education institution. One way thereby can be that the on-going supervision is done by a principal supervisor; in addition to that an annual progress meeting with a follow-up group that can also include external members takes place.	<i>divided supervision</i>
ProDoc/SUK Doktoratsprogramm Switzerland	There are no data for ProDoc available. As the SUK Doktoratsprogramme have been recently implemented they do not include regulations as regards the supervision of doctoral students. However, a report on the state of the art of doctoral training in Switzerland from 2008 showed that the master-apprentice-model was still prevalent although there was also a trend towards more team supervision.	<i>individually regulated by universities</i>
Denmark	According to the law on doctoral training universities have to appoint a principal supervisor for each doctoral candidate.	<i>divided supervision</i>

Source: IHS – CHEPS – AIT

6.2.3 International orientation

The international orientation of the funding programme/scheme can be related to very different activities. These activities may include e.g. the possibility to invite guest researchers from abroad, collaboration with other higher education institutions and research institutes from abroad, involving international members in the supervising team and funding of research stays abroad.

In the following the funding programmes/schemes of the countries under review will be investigated with regard to their international orientation. We therefore distinguish whether the selected programmes are

more interested in the funding of research collaboration or intend to fund the international exchange and expose doctoral students to more international networks.

Table 10: International orientation

Funding programme/ Scheme/Country	Description of international orientation	Type of international orientation
DFG Research Training Groups Germany	Besides interdisciplinarity the aim of increasing internationalisation is very important. To increase the international collaboration also a further funding programme, the so-called International Research Training Groups, has been established where students are obliged to have a long research stay abroad. Regarding the national Research Training Groups the programme provides funding for visiting scholars and guest professors. It is also promoted that the supervision teams have international members.	research collaboration
NWO Graduate Programme The Netherlands	The programme does not indicate internationalisation as a goal of its funding. The allocated money only funds the salary and the research costs for the doctoral students. Other expenses have to be covered by other sources of the host university.	n.d.
National Graduate Schools (Forskingskolen) Norway	The funding is interested in strengthening the collaboration among Norwegian higher education institutions. The funding scheme explicitly indicates that internationalisation measures are also funded. Some of the National Research Schools have also provided grants to doctoral candidates for research stays abroad. In the midterm evaluation it has been questioned whether this should be changed and the funding of research stays abroad should be the responsibility of the individual host institutions.	international exchange
Finland	In 2006 there was an evaluation report on the doctoral education in the Graduate Schools published which stated that each of the schools has built its own internationalisation strategy based on different specificities (e.g. disciplines or persons included): <i>“The international cooperation is mainly based on foreign lecturers, student participation in international conferences, and student exchanges. Some GS are participating in Nordic (e.g. NorFA) or EU doctoral education networks. There are also some international joint research programs (e.g. Infotech Oulu Graduate School; The Doctoral Studies Program in Management and Organization at HANKEN)”</i> (Dill et al., 2006, p. 58f.). In 2011 a review of the Finnish doctoral education claimed again that the scope of internationalisation strategies is too small; in particular too few doctoral candidates go abroad. Then the reform of doctoral training followed which implies that the internationalisation strategies are nowadays more in the hand/in the responsibility of the universities.	international exchange, attempt to increase research collaboration
ProDoc/SUK Doktoratsprogramme Switzerland	There is no data/information available on internationalisation.	
Denmark	The law on doctoral education prescribes that doctoral candidates need to spend research stays at other institutions during their doctoral studies. Preferably these should be foreign institutions.	research collaboration

Source: IHS – CHEPS - AIT

6.2.4 Implementation compared

When comparing the funding programmes/schemes with regard to the three dimensions mentioned above we see that the kind of orientation is clearly reflected in the implementation.

Thus, funding programmes/schemes with an *educational orientation* can mostly be characterised as:

- providing open access to their services; students can easily access the courses and trainings offered by the research schools; and

- providing research training for all doctoral students, in some countries participation in training is even compulsory during doctoral studies.

In contrast, funding programmes/schemes that are *research oriented* or aim to foster research excellence do not provide open access to their services. Here training is mostly provided to a selected group of students dealing with topics that are directly related to their research. Also the international orientation is more interested in achieving research collaboration rather than international exchange.

Given these evidences the *FWF DK Programme can clearly be identified as a research oriented programme* as it uses to have closed access, different forms of shared responsibility in the supervision of doctoral candidates and it invests in international research collaboration.

The experiences of research oriented funding programmes/schemes show that a strong focus on research is mostly at the expense of a possible educational mission in doctoral training, in particular at the mission to contribute to the improvement of doctoral training in general. For example the Swiss case shows that the former *ProDoc* programme was not able to have an impact on doctoral education at the institutional level and on the doctoral education in Switzerland in general. Here the outreach to doctoral candidates was too low and the research project on good practices in doctoral education did not work out in the way planned as mainly researchers and not the universities as responsible institutions were targeted with the funding. Apparently, opening the access to special trainings in doctoral education and obliging universities to build organisational frameworks for doctoral training reveal to have a greater impact on a general change and improvement of doctoral training.

The *Research Training Groups* of the German Research Foundation on the other side were able to have an impact on research and on the educational strategy of doctoral training. This success was supported by the sheer volume of the programme as well as by the involvement of important actors among stakeholders in the German higher education system. In particular, it was the engagement of the German Council of Science and Humanities and the interest of the big research foundations that are actively supporting PhD research. Here the Böll-Foundation and the Hans-Böckler-Foundation as well as the engagement of the big research organisations like the Max-Planck and the Leibniz-Society contributed actively to an increase of structural doctoral training in Germany. The ongoing implementation of *Graduate Schools* enhanced by the *Excellence Initiative* has also strongly supported the practice of structural doctoral training.

Facing these developments we recognise that a strong orientation on excellence in research for a selected group of students can also have certain advantages. Among these advantages are that these students mostly receive tailor-made training and have close working relationships with their fellow students and supervisors. Reaching out for a higher number of students and providing general training mostly has to face the problem that it cannot respond to the specific training needs of the individual students and might not be related to their research topic. In those settings especially students criticise the low demand-orientation of the training, sometimes even declare it as a burden. The implementation of national research schools that complement doctoral training at higher education institutions can be thus seen as a solution to solve this problem. Within the collaboration of higher education institutions a critical mass of doctoral students with a specific training need can be achieved. Strengthened disciplinary collaboration across institutions instead of improving the general engagement of institutions in doctoral training hence covers both improving doctoral training and responding specific training needs of students in an efficient way.

When deciding on the orientation of a funding programme/scheme of doctoral training it should be considered whether the goal is to reach out for a higher number of students and to make a general contribution to a reform or improvement of doctoral education or to fund excellent research in doctoral training. As experiences from other countries show a combination of both goals is difficult to achieve. Indeed, it needs lots of investments and the improvement of doctoral education needs to be on the agenda

of the different stakeholders in the higher education system. Instruments that are not strongly supported by these stakeholders are mostly just able to realise the funding of excellent research. However, funding disciplinary networks across higher education institutions that also focus on excellent teaching on the doctoral level might be a promising alternative to achieve demand-tailored training.

6.3 Output of the programmes

Data on the output of the programmes is hard to gather. Programme evaluations mostly look for the impact of the instruments on the efficiency of the training in terms of the time to degree and the graduation rate. Some programmes/schemes are also evaluated as regards their outreach or coverage of the population of doctoral students.

Table 11: Output of the programmes

Programme	Time to degree	Graduation rate	Coverage of doctoral students
DFG Research Training Groups (Cohort 2008) Germany	36 months ⁵⁸	10% of all members of a GRK per year	5,340 doctoral students (in 2007) in GRK – estimated about 8.9 % of all doctoral students from the 2008 cohort
PRODOC SNF CRUS Switzerland	no exact data available; generally 3-4 years depending on discipline and working conditions	no data available	research module: 1.8% of all doctoral students training module: approx. 3-4% of all doctoral students
National Graduate Schools (mid-term evaluation did not gather data) Norway	on average 5.1 years in 2011	44% of the cohort starting 2006-07 completed after four years, around 75% after 10 years (cohort 2000-01)	no data available – for students from participating disciplines and institutions about 100% could participate (when open access)
Denmark	students graduating between 2008 and 2011 on average about 4.0 years	no data	All students participate in the training offered by the university/graduate school.
Finland			Only 10% of the doctoral candidates were participating in the doctoral schools.

Source: IHS – CHEPS - AIT

The table above gives an overview of the data that we were able to retrieve. Data sources are indicated in the Appendix V. However, data on the research output of the funding programmes/schemes, in particular of those that also fund the research of doctoral students, are - to our knowledge - not available so far.

⁵⁸ In their monitoring reports the German Research Foundation distinguishes between different calculations for time to degree. The number presented in the table above refers to the time span between the entrance of the student in the Research Training Group and handing in the final thesis for examination. Periods as an eventual preparation of the thesis before becoming a member of the Research Training Group or the time span till between handing in and the oral examination are not considered in this number.

This short overview already makes clear that indicators on the efficiency of doctoral training are constructed very differently across the funding programmes/schemes. In particular, the time to degree and the completion rate differ. Drop outs from doctoral training are mostly not monitored. The analysis of the FWF DK survey in 2013 reveals that the time to degree is about 36 to 53 months depending on the discipline (see chapter 3). In that respect the FWF DK does not differ from the other funding programmes/schemes.

6.4 Significance of the programmes

As stated in the introduction to this chapter the term *significance* refers to the contribution of the funding schemes to the reform of doctoral training. All countries under review have been actively working on the reform and improvement of doctoral training/education in the recent years. Improving the quality and increasing the efficiency of the training have been the main policy goals. In addition to that also excellent research and the training of excellent young researchers are goals that should be realised.

As we observe in the international comparison, within the countries very different approaches have been chosen to achieve these goals. Thus, in the following we will distinguish between two different approaches to increase the impact on doctoral training: the wide and the focused approach.

Wide approach

For the Nordic countries, Denmark, Norway and Finland it became clear that the improvement of doctoral training was mostly on the agenda of the Ministries of Education. In these countries based on reviews of the current state of the doctoral training strengths and weaknesses have been identified and measures for improvement have been concluded. Typically, these measures aim to reach out for a high number of students, i.e. to include all students in new forms of doctoral training. Here we also find a strong convergence among the Nordic countries – all of them integrated regulations on doctoral training in the higher education law and obliged universities to implement organisational frameworks for doctoral education. Doctoral training has thus become an important part of the teaching function of the higher education institutions. The laws also define a minimum number of ECTS that have to be achieved in course work during doctoral studies.

In addition to that these countries include the funding of doctoral training in the lump sum funding of universities. Here, universities are free to decide how they spend these funds as for instance, whether or not they would like to pay individual fellowships for doctoral students from that money. In any case the money has to be used to sustain the organisational structure for doctoral training like a *Graduate School*, i.e. the educational part of doctoral training is mostly funded by this money. Nonetheless, it turned out that reaching out to train all doctoral students at a university in some cases leads to an over-standardised offer of courses that does not meet the specific training needs of doctoral students related to their specific research project. Also it is evident that excellence in teaching cannot be realised well in this encompassing approach. Here, collaborations of universities in disciplinary fields to set up doctoral study programmes or a course offer serving different specialisation tracks in the fields of study complement the offer at universities in an efficient manner.

Changes in the funding of doctoral education did not only affect the lump sum funding of the higher education institutions provided by the ministry. Also research funding schemes of the national research councils have been adjusted. For example, in Denmark a certain amount of project money has to be dedicated to doctoral students and doctoral training.

Focused approach

For Germany and Switzerland we find that the goal to improve the quality and increase the efficiency of doctoral training was mostly enhanced by stakeholders in the higher education system (we just want to note that both countries have a federal structure). Here the solution was to define a new form for doctoral training that combines research and training for a selected group of excellent young researchers. Mostly these approaches aim to fund small groups that might serve as incubators as they implement good practices in doctoral training that can also be easily adopted to other settings at the university or used to improve the doctoral education in general. While this effect was realised for the German funding scheme (see above) the implementation more or less failed in Switzerland. Here new measures to reach out for a higher number of doctoral students have been implemented.

Also the Dutch funding scheme can be identified as a focused approach, though the Ministry is mainly interested in a special measure to improve doctoral education and the funding scheme is oriented towards research and the promotion of excellent young researchers. Here universities are obliged to contribute to the training of the doctoral students by providing adequate structural training. The programme thus formulates an incentive for universities to engage in the improvement of doctoral training in order to receive the highly prestigious funding.

Comparing these two approaches reveals that they have changed doctoral education in different ways. For the first approach - the wide approach - it becomes clear that the main goal is to increase the number of students participating in structured doctoral training in a significant way. With the obligation to implement an organisational framework for doctoral education the universities received more steering capacity over doctoral education, also the aim to standardise regulations for doctoral studies has been realised here. Regarding the educational strategy the structured doctoral training also supported to institutionalise the doctoral training as part of teaching. For the second approach - the focused approach - it becomes clear that the main goal is to improve doctoral education at all, i.e. to improve the conditions for teaching as well as for learning for doctoral students and to preserve the nexus between teaching and research. Here the focus is mainly on the institutionalisation of high quality in doctoral education. Thus, this approach can be also seen as a successful role model for the improvement of doctoral education, given that it receives strong support from stakeholders being engaged in the reform of doctoral education. In case there is a lack of this support and beneficiaries of the funding are mostly interested in the funding of research it is difficult for the programmes/schemes to have an impact on doctoral education at all. Consequently, here also the kind of networks the Principal Investigators or speakers of the programme are integrated in are important, also the interest of the university management in the experience and success of the groups plays an important role in spreading new forms of doctoral education.

Currently, the actual practice of the FWF DK Programme is more similar to the focused approach. While this works well within the DK (see chapter 3), DK have little impact on the overall reform of doctoral training in Austria and at Austrian higher education institutions. Also the discipline plays an important role for the impact of DK. They seem to have a greater impact in those disciplines where traditional cultures of doctoral training were closer to the DK model than in disciplines that have clearly different cultures. The latter is in particular true for the Social Sciences and Humanities. As shown in chapter 5 here the DK have been able to replace solitary and individualised working cultures by team and course work at least within the DK. Unfortunately these approaches did not trickle down to other doctoral training in these disciplines in general so far.

7 Lessons learned

One goal of the evaluation is to contribute to the further development of the FWF DK Programme. While the chapters 3, 4 and 5 have already indicated some empirical evidences for conclusions and suggestions concerning the procedural aspects of the implementation, the following chapter will focus more strongly on the general goal of the programme that is to improve the doctoral training in general. Therefore, we first look at the lessons learned from the international comparison. Then we will discuss different scenarios developed by the FWF Programme Management and the evaluation team in order to show what feasible and non-feasible ways for the further development of the FWF DK Programme are. Finally, we will draw some conclusions based on the empirical findings of our study and will point out issues for incremental or small changes and big changes as well.

7.1 Lessons learned from other countries

The international comparison has shown that changes in the funding mechanisms have a significant influence on the implementation of doctoral training. While the scenarios discussed in this evaluation study mostly stipulate changes in the scope of funding as a whole, we observe that in other countries/funding schemes that have been changing the funding a distinction between different costs for the funding of doctoral education was made. Here, it has been clearly distinguished between the costs for the educational part of doctoral training, the staff costs and the costs for research and international collaboration. Reforms in the funding of doctoral education were mostly based on this distinction.

Accordingly we find that countries/funding schemes that pursue a *wide approach* focus on the funding of the educational part of doctoral training. Here all costs that are related to education (costs for teaching, rooms, materials, preparation of courses, costs for international mobility etc.) are included in the funding. The funding mostly comes from the Ministry and targets the institution as it is part of the institutional lump sum funding. It is not provided to individual researchers or a consortium of researchers. Also the funding of the research and most of the staff costs for doctoral students comes from other research funders or sources. This move towards the funding of the educational part was mostly driven by the governmental level, i.e. by the Ministries for Education/Science. For example all Scandinavian countries under review here shared similar problems as regards doctoral training: the number of graduates was evaluated as too low, the time to degree as too long and the age of graduates upon graduation as too old. Also, the inefficient use of funding for doctoral education has been criticised. In addition to that, reforms of doctoral training mostly took place in line with a general reform of the higher education system. This was in Finland the recent devolution of higher education institutions, in Denmark the reform of higher education in five waves and in Norway the so-called Quality Reform. Here in preparation to the reforms also encompassing reviews of the national higher education systems by international committees were done.

Countries that on the other hand pursue a *focused approach* fund by the means of their instruments all kinds of costs related to doctoral training such as educational, staff and research costs. Here the funding is provided to the researchers applying for the money; the funding is mostly not addressing the institution.

Table 17: Central characteristics of policy approaches

	Wide approach	Focused approach
Main funder	ministry	research foundations
Main receiver	higher education institution	researchers (mostly consortium)
Costs covered	educational costs of doctoral training	education, staff, research costs
Goal	<ul style="list-style-type: none"> - outreach to a high number of students - standardisation of doctoral education, implementation of structured doctoral training - achieve steering capacity on doctoral training - institutionalise doctoral training as part of the teaching function of higher education institutions 	<ul style="list-style-type: none"> - promote excellent research and excellent young researchers - implement new forms of doctoral training - build role models - have an impact on doctoral training
Strengths	<ul style="list-style-type: none"> - achieve (more or less) homogeneous training conditions for all doctoral students - improving/changing the status of doctoral students 	<ul style="list-style-type: none"> - possibility of tailor-made doctoral training - offering highly specialised training on selected topics and providing possibilities to collaborate with researchers in the same area - fostering the teaching-research nexus in doctoral training
Weaknesses	<ul style="list-style-type: none"> - mostly not connected to the research and the training needs of the students - loosening the teaching-research nexus in doctoral training 	<ul style="list-style-type: none"> - only low outreach to students - spread of role model for teaching only under certain conditions (mostly not successful) - high costs for very specialised training and research

Source: IHS – CHEPS - AIT

We also note that those countries that have been changing their funding for doctoral education in the recent years mostly revisited their general goals for doctoral education. Thus, in the Nordic Countries a strive for a higher efficiency in doctoral training and the possibility to gain some steering capacity was most pressing, while for Germany an increase in efficiency was a claim in the innovation of doctoral training.

In order to change the funding strategy of doctoral training, particularly the Nordic countries undertook an encompassing review of the state of the art of their doctoral training before starting/developing new instruments and funding schemes (Norway, Finland). In addition to that the recent Finnish reform was strongly oriented towards international developments; here policy instruments were implemented as these were concluded from the analyses done and supported by the legislation as well.

Thus, a lesson to be learned from the countries that have been changing their strategy of doctoral education is that an encompassing review of the state of the art of doctoral training in the country took place.⁵⁹ In this vein the state of the art built the base for the further development of funding programmes/schemes and adequate policy instruments. To create a common understanding of what the aims of a PhD/doctoral study was seen as essential. Here recent developments in the Nordic Countries also show that in order to improve the doctoral training in general, the responsibility for doctoral education has

⁵⁹ A first step to investigate the different practices of doctoral training in Austria was done by the study of Pechar et al. (2008) and the analysis of the FWF in 2010.

moved from the research agencies/foundations to the Ministry of Education (e.g. in Finland); i.e. these countries have decided to follow a more education oriented way of doctoral training (realised by a wide approach) in the recent past.

7.2 Discussion of scenarios

According to our research proposal we developed different scenarios for the further development of the FWF DK Programme with the FWF Programme Management. The aim was to discuss different scenarios with stakeholders as the university management, higher education policy makers and the Principal Investigators of the DK. In interviews the following scenarios – each representing a future pathway – have been discussed:

- a. There is no change of funding in the FWF DK Programme.
- b. The FWF reduces its funding volume as
 - the FWF is funding just a share of 50% of the volume granted to the DK, other sources (like industry, ministry, scholarships etc.) have to fund the other half;
 - the FWF is funding just the first funding period of the DK, the follow-up periods have to be funded by the respective university/host institution;
 - the FWF is reducing its funding volume for the DK from period to period;
 - the FWF is funding just the personnel costs for doctoral candidates whereas the university/host institution has to cover the costs of infrastructure etc.
- c. The FWF stops the funding of the DK Programme as a whole; instead the FWF will fund more research projects/PhD projects within the funding scheme ‘Stand-alone Projects’.

It is not surprising that *scenario a* is the most favourable when discussing with the Principal Investigators the different future pathways of the DK. However, some interview partners have already recognised the need for cutting funds by the FWF. A few Principal Investigators found that *the gradual reduction of funding in scenario b* might be a feasible way. In contrast, overtaking a share of 50% by other sources was regarded overall as unrealistic; in particular this scenario was seen as definitely not practicable for DK in the Humanities and Social Sciences. Among all interviewees there was just one interview partner who agreed that this scenario would be feasible; all other interviewees refused this to be a realistic option. None of the interview partners supported the scenario of funding just the first period by means of the FWF. There was no interviewee who believed that the costs of funding for the follow-up periods of DK could be totally covered by the means of the university. The scenario that the FWF is funding just the personnel costs was denied either. The interviewees also pointed to the fact that the universities are already covering the costs for infrastructure etc. (see chapter 3 and 5). Also the idea to stop funding for the main assets of the FWF DK Programme (costs of international recruiting, inviting guest lectures, organising summer schools or the personnel costs of a Coordinator) was seen as a considerable curtailment of the added value of the DK Programme. Finally, to stop the DK Programme as a whole was not even discussed by the majority of interview partners.

Drawing on the views of the Principal Investigators there seems to be no feasible way of reducing funding by the FWF and maintaining the added value of the DK at the same time. Also, there are no possibilities to increase funds by the universities as these are facing considerable budget constraints, too. This view gets also confirmed by the university management. In fact, representatives of the university management argued that there is no room to increase funding for DK from their side. This was also mentioned in the relation with the fact that the FWF pays no overhead costs at all in the DK Programme. Consequently, the universities already have to cover the indirect costs of the DK so that the commitment given by the universities to support DK is regarded as quite generous already.

Another issue was to discuss whether there might be more commitment on the side of the universities, in particular whether universities might increase investment in the DK and provide sustainability in the case the regulative framework of the FWF DK Programme is built on an institutional funding instead of a personnel funding scheme as the programme has been regulated up to now. Here the discussion with the Principal Investigators has become quite emotional. In fact, there were just a few researchers who were open to change the regulative framework of funding in that way (from §26 to §27 UG 2002); in this context one researcher even noted that from the experiences he made there is no difference if the funding is based on a personnel or an institutional based contract scheme. However, the overwhelming majority of Principal Investigators was definitely against this option. Most of them argued that it is important to keep up the bottom-up scheme and to support the ideas and projects from the base; therefore the researchers are also willing to take over responsibility. Changing to an institutional funding scheme might imply that the (university) policy determines the research agenda and intervenes which people have to be involved in. It is not surprising that the picture on this issue changes when discussing the optional change to an institutional funding scheme with the rectors and vice-rectors of Austrian universities. It is evident that these show much more openness towards such a change; some noted that an institutional funding scheme becomes also increasingly a pre-condition to receive additional funding from the initiatives/programmes set up on the European level. Others argued that they are open to this way but would not necessarily enforce it. One interview partner even stated that the mood among the high-level researchers under review that do indeed excellent research in Austria has to be respected. However, all rectors and vice-rectors denied that a change to an institutional funding scheme might have an impact on their level of commitment, influence their decision to take over more costs of the DK.

7.3 Conclusions and recommendations

From the perspectives of the university management and the researchers the Doctoral Programme of the FWF is regarded as an excellence funding scheme. It works well in the fields of the Life Sciences and also in the Natural and Technical Sciences; it does not seem to have a strong impact on doctoral training in the Humanities and Social Sciences in general. However, the Doktoratskollegs have an added value that derives from a couple of benefits. Among these benefits are the long-term funding of research projects on an internationally high scientific level, the openness of the programme for all kinds of research topics and interdisciplinary approaches, the strengthening of intra- and interorganisational collaboration, the fostering of structured doctoral training including skills training elements, supporting international mobility as well as the possibility to recruit international doctoral candidates for employment at Austrian universities. Additionally, DK contribute to build up critical mass and strengthen priority setting in (prospective) fields of research at universities. To increase visibility, DK are embedded well within the institutional framework of universities. To enforce this, the training programme of DK is open to non-DK members and the DK collaborate with large-scale research programmes like the Special Research Programs funded by the FWF or the Christian Doppler Laboratories. It is evident that the visibility of DK increases the longer the DK exist. Also the reputation of the host institution plays a crucial role here.

Besides this overall excellent performance the evaluation also identified some issues that might be considered for a fine-tuning of some procedures:

- For many stakeholders involved in the evaluation study there is the need *to clarify what the doctoral training stands for* in Austria. *What is the mission of doctoral training in Austria - should it be more education-oriented or research-oriented?* In fact, Principal Investigators of the DK are faced with such not clarified issues in the agenda of higher education policy and have to deal with them as they have to position the DK as high level research and training programme for doctoral

students at their university. Thus, to reduce uncertainty it might be essential that the ministry responsible for higher education takes over the responsibility to make it more clear what aims the doctoral training in Austria has to follow.

- Looking at the profile of DK the evaluation study shows that to date the DK have mainly trained doctoral candidates towards an academic career. Therefore the graduates have to go through a specialised research training in order to be successful on this highly competitive international job market. This strategy works as DK graduates usually go abroad to pursue an academic career.⁶⁰ However, it is evident that the DK in Life Sciences have become more open-minded in recent years as they train their candidates also for jobs outside academia and thus follow a broader profile of doctoral training. This aspect of building a profile of profile has also to be with the need of clarification what doctoral training in Austria stands for and how the DK are positioned in this respect, in other words: *shall the DK mainly serve as a preparation for an academic career or also prepare doctoral candidates for other labour markets where highly qualified people are needed?*
- The quantitative analysis and also the interviews show that just a minority of DK candidates has completed their PhD study within the funding period of three years. Besides there is the option to extend the funding duration for a further year it should be a key goal of the DK Programme *to enable the completion of doctoral training in time*. To support this, instruments as progress monitoring done by the DK and more flexibility regards the funding duration on the side of the FWF Programme Management might be supportive. However, the evaluation team considers that the low percentage of graduates is not just specific for DK. As the international comparison reveals there were discussions on the length of doctoral studies, mostly focussing on problems like delay and slowness of doctoral candidates, also in other countries in recent years. Thereby limiting the period of doctoral studies to three years is mostly seen as a means to lower the time to degree and also the age of the graduates. This approach sometimes is at odds with the requirements for excellent research. Consequently, for the further development of the programme we recommend to reconsider deliberately the importance of the goal to achieve excellent research results and the importance of the goal that doctoral degrees are completed in the shortest period of time. In case that the excellence of the research results is valued as more important we recommend that the programme sets as a rule that the funding periods for doctoral candidates should be aligned to the requirements of the planned research. Here the full proposal might be an instrument that indicates what time would be needed to complete a dissertation project related to a research project in a reasonable way. The maximum period for funding of a doctoral candidate should be set to 48 months. When applying for a longer funding period than 36 months it should be indicated in the proposal why an additional year will be necessary to conduct the project.
- In this context also *the current policy* of the FWF DK Programme *to reward a longer stay abroad by an additional year of funding should be reassessed*. Here we recommend that stays abroad should already be considered when planning the time needed for the dissertation project. Stays abroad should be related to the actual research needs as well as the training needs of the doctoral candidate. The current rule to grant a fourth year of funding when having been abroad for three months during the first three years probably sets a wrong incentive: Here doctoral candidates might go abroad for a period of three months though this stay might not be needed for their research project or their training needs. Relating the time planning for the funding period to the actual needs of the research would support to implement more focused stays abroad.

⁶⁰ Unfortunately, the FWF DK database does not allow to analyse the research career of DK graduates.

- According to the programme guidelines the FWF DK Programme aims to provide doctoral training embedded in a research-intensive environment. However, to fulfil the requirements of an efficient programme monitoring/quality assurance and to benchmark the international competitiveness of the FWF DK Programme there is the need to put *a stronger focus on further performance indicators*. In particular, indicators such as time to degree and career development of researchers who have completed their PhD within the DK have to be considered, regarding the further development of DK. Here the evaluation and monitoring of the Research Training Groups done by the DFG can serve as a role model. Here elaborated models, in particular to measure the time to degree have been set up (DFG, 2012a). In Norway also the later careers of doctoral graduates have been investigated (NIFU, 2012).
- To promote gender equality measures have been implemented to support women who would like pursue an academic career. Some respondents indicated that more support in terms of best practice models for achieving more family friendly conditions provided by the FWF would be beneficial to them.
- The flexibility of the DK Programme and the possibility to adjust the programme to specific needs of the disciplines and the host institutions is very much welcome by the Principal Investigators and the university management. Nonetheless, Principal Investigators indicate that some regulations are not clear to them. Here we recommend that the programme management checks current regulations for consistency and whether there is a need to document potential interpretations of current regulations. Altogether, this could help to *improve clarity and transparency* in the application of the regulations.
- Besides the added value realised by the DK the FWF DK Programme also represents an important funding scheme for the universities as a whole. Thus, one aim of the evaluation study was to investigate if there is any feasible way to increase the university's commitment towards taking over more costs of the DK. However, the interviews with Principal Investigators and representatives of the university management showed that there is no feasible way to do this, especially when facing that the FWF does not refund overhead costs in the large-scale research projects. Consequently, following the aim of increasing the institutional funding on the side of universities might also imply to implement the *payment of overhead costs* in the DK Programme by the FWF.

Generally, *we recommend the continuation of the FWF DK Programme* as it works well, it achieves added values and it represents an important scheme of funding high-level research and doctoral training in Austria. In doing so, the DK Programme is complementary to the universities' initiatives and activities. Also from the view of the national higher education policy the FWF DK Programme is an important instrument to provide funding in a competitive procedure to universities. According to the higher education policy's view both the means of the universities' global budget and the competitive funding programmes of the FWF should fund possibilities to support early stage researchers. Both ways of funding are essential for the higher education system in Austria. Nonetheless, developments on the European level and experiences from other countries show that the ways of funding for doctoral training have changed in recent years. Also in Austria there is some evidence that the funding of doctoral training might undergo bigger changes in the coming years. This becomes particularly true when Austria is going to realise the strategic goal of implementing a unit cost model for funding teaching at universities (the full implementation is planned for 2019). With regard to this funding model for teaching it also has to be considered which role doctoral training plays in Austria and how the funding of doctoral studies at universities should look like. Given such

considerations it is also possible that the implementation of a unit cost model for teaching will have an impact on the funding of doctoral training, in particular on the FWF DK Programme.

Given the current severe budget constraints it is not possible to determine the future developments of Austrian higher education yet. However, the potential implementation of a unit cost model for teaching at universities serves as a good reason to contemplate – at least theoretically – a bigger change of the FWF DK Programme. The following two scenarios were based on the experiences from other countries and intend to present a first input *to reflect about these bigger changes*:

1. Supposed that the FWF DK Programme is seen as an instrument to support excellent research and promote bright young researchers we suggest that the future funding should only fund costs for research and doctoral candidates. All educational costs as well as the organisational framework for doctoral education have to be provided and funded by the host institution. Applications for the funding scheme have to prove a training concept and that the training programme for the doctoral candidates offered by the institution is excellent. Here the Dutch NWO Graduate Programme can serve as a role model. Offering additional funds for excellent research under the condition that the institution engages in doctoral training can serve as a strong incentive for the further development of structural doctoral training at Austrian universities. One of the advantages of this approach is that the activities of the researchers have to be combined with the engagement of the institution. The establishment of research groups thus becomes more integrated into the activities of the institution and loses its solitary status. Experiences from other countries show that this further development might need support from the ministerial bodies that are in charge of higher education. Here the funding of doctoral education should be considered in the performance agreements with the universities. Also funds for establishing doctoral schools at the central level of the universities should be provided.
2. Supposed that the FWF DK Programme is seen as an instrument that should contribute to a general improvement of doctoral education similar to the wide approach we would recommend to discontinue the FWF DK Programme and set up a new programme that supports universities in setting up internationally competitive doctoral programmes or networks of Austrian universities setting up national disciplinary research schools.⁶¹ The Swiss development as well as the Norwegian scheme of national research schools could serve as a role model here.⁶² Again, support from governmental bodies would be needed to support this strategy.

Both scenarios imply bigger changes that address the FWF as a funding agency and the Austrian higher education system as a whole. Both scenarios will require support from the policy level and should be based on an encompassing review of the doctoral training at Austrian universities in order to follow adequate goals. In this review also the FWF should play a prominent role as the DK Programme has been quite successful to enforce structured doctoral training and set up a best practice model at Austrian universities.

⁶¹ One idea could be to set up a scheme that funds centers for excellence in doctoral training, the Norwegian model of the national research schools could serve as a model here.

⁶² The legal possibilities for setting up a programme that is mainly funding institutions should of course be checked carefully.

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Appendix I Interview guidelines



INSTITUT FÜR HÖHERE STUDIEN
INSTITUTE FOR ADVANCED STUDIES
Eco & Fin APPLIED RESEARCH Vienna



AUSTRIAN INSTITUTE
OF TECHNOLOGY



Center for
Higher Education
Policy Studies

FWF DK-Evaluierung: Interviewleitfaden für DK-LeiterInnen

1. Kurzvorstellung des Evaluierungsteams und der -ziele

IHS, CHEPS & AIT

Keine Programmevaluierung i.e.S.; es geht vielmehr um Herausforderungen, Entwicklungspotentiale und um die Diskussion von Szenarien

2. Programmmanagement, -administration und -ablauf

Sind die Kriterien der Antragstellung passend? Inwieweit sind die Anforderungen des FWF adäquat zu erfüllen? Inwieweit wird die Beratung durch den FWF als Unterstützung gesehen bzw. in Anspruch genommen?

3. Antragstellung und Motivation

Wie wird die Programmausrichtung der DK (komplementär zu den SFBs) beurteilt? Gibt es fachspezifische Besonderheiten (z.B. in den GEWI), die bei der Programmausrichtung zu beachten sind?

Was ist die Motivation seitens einer bzw. eines ausgewiesenen Wissenschaftlerin bzw. Wissenschaftlers, sich für ein FWF-DK zu bewerben?

Inwieweit verhält sich das Kosten-Nutzen-Verhältnis bei der Antragstellung?

4. Erfolgsfaktoren von DK/Wirkung der DK auf die Universität

In welcher Weise unterscheiden sich die FWF-DK von anderen Formen der Doktorandenausbildung an der Universität?

Was macht den Erfolg eines FWF-DK aus? Durch welche Faktoren (Internationalität, Interdisziplinarität etc.) wird dieser Erfolg bestimmt? Welche Spezifika sind auf die Disziplin zurückzuführen?

Ist die Förderlaufzeit (u.a. die Kopplung des vierten geförderten Jahrs an einen Auslandsaufenthalt) passend?

Inwieweit können die beteiligten WissenschaftlerInnen über ihr Budget verfügen?

5. Einbettung an der Universität

Wie offen/geschlossen sind die DK; d.h. in welchem Ausmaß ist das FWF-DK in das Forschungsgeschehen und in die Lehre der Universität eingebunden?

Welche Effekte entstehen durch diese Integration? Nimmt das FWF-DK auch Einfluss auf die Doktorandenausbildung an der Universität? Wenn ja, in welcher Weise?

Inwieweit tragen DK zur Sichtbarkeit/Profilierung von Forschungsschwerpunkten an der Universität bei?

Ist das Commitment seitens der Universität für den Erfolg des FWF-DK entscheidend?

Wie wird das Commitment der Universität gegenüber dem FWF-DK beurteilt?

6. Doktoratsstudierende im DK

Welche Zielstellungen werden mit der Doktorandenausbildung durch die FWF-DK für die DoktorandInnen selbst verfolgt?

Wie unterscheiden sich die DoktorandInnen im FWF-DK von anderen DoktorandInnen in anderen

Ausbildungsformen?

Was ist die kritische Größe eines DK? Ist diese Größe leicht zu erreichen?

Welche Rolle spielen hierbei die assoziierten KollegiatInnen?

Wie sieht die Idealbesetzung eines DK im Hinblick auf die Zusammensetzung der Studierenden (hinsichtlich Geschlecht, Disziplin und Internationalität) aus? Welche Effekte erhofft man sich aus einer solchen Zusammensetzung?

Wo und bei welchen Arbeitsgebern finden sich ehemalige DK Studierende wieder? Gibt es Unterschiede zu „normalen“ DoktorandInnen?

7. Kooperation/Vernetzung

Inwieweit passiert eine Vernetzung unter den DK (z.B. Austausch unter den SprecherInnen)?

Inwieweit findet eine Kooperation mit anderen DoktorandInnenschulen/Graduate Schools bzw. strukturierten Doktoratsausbildungsprogrammen statt?

8. Zukünftige Gestaltung der Doktorandenausbildung

Wie sollte die Doktorandenausbildung in Zukunft aufgestellt ein:

- an Ihrer Hochschule?
- in Österreich (durch welche Institutionen sollte die Finanzierung der Doktorandenausbildung getragen werden)?

Inwieweit soll der FWF in Zukunft neben der Qualitätssicherung der grundlagenorientierten Forschung auch die Qualitätssicherung in der Ausbildung von DoktorandInnen übernehmen?

9. Veränderungspotentiale

Welche Veränderungspotentiale ergeben sich aus Ihrer Sicht für die DK?

Ist z.B. eine Umstellung von einer § 26-Förderung auf eine § 27-Förderung (Institutionenförderung) erwünscht? Welche Vor- und Nachteile hätte eine solche Umstellung?

10. Diskussion von Szenarien

- a. Das FWF-DK Programm bleibt unverändert.
- b. Der FWF reduziert seinen Finanzierungsbeitrag.
 - Der FWF zahlt nur noch 50% des DK, die anderen Mittel müssen aus anderen Quellen (Industrie, ministerielle Mittel, Stipendien etc.) finanziert werden.
 - Der FWF finanziert nur noch die 1. Phase des DK; danach müssen die Universitäten eigene Finanzierungsstrukturen aufstellen.
 - Der FWF reduziert sein Budget von Phase zu Phase eines DK.
 - Der FWF zahlt nur noch die Personalkosten für die DoktorandInnen; Infrastruktur, Räume etc. müssen von der Institution getragen werden.
- c. Der FWF stellt das DK-Programm komplett ein und fördert nur noch Forschungsvorhaben/ Dissertationsvorhaben in den Einzelprojekten.

11. Zukunft des DK

Was soll nach Auslaufen des DK passieren? Welche langfristige Perspektive gibt es für das DK an der Universität?

Wie hoch ist das Potential für DK an Österreichs Universitäten? Gibt es bereits in einigen Disziplinen eine Sättigung oder wird die Nachfrage nach wie vor gegeben sein bzw. weiterhin steigen?

12. Sonstige Anregungen

Appendix II Interview partners

Principal Investigators and Coordinators of DK

University	Doktoratskollegs	Principal Investigator/Coordinator
University of Vienna	W1228	Mitchell Ash
	W1204	Alois Woldan
	W1210	Markus Arndt
	W1220	Manuela Baccarini
Medical University of Vienna	W1205	Stefan Böhm
	W1207	Andrea Barta
Vienna University of Economics and Business Cooperation partner IHS	W10	Josef Zechner, Alois Geyer Leopold Sögner
University of Veterinary Medicine Vienna	W1225	Christian Schlötterer
University of Graz	W09	Ellen Zechner
	W1229	Alfred Wagenhofer
University of Salzburg	W1213	Josef Thalhamer
Vienna University of Technology	W1219	Günter Blöschl
	W1243	Ulrich Schubert
University of Natural Resources and Life Sciences, Vienna	W1224	Christian Obinger, Christa Jakopitsch
Medical University of Graz	W1226	Gerald Höfler
Graz University of Technology	W1230	Wolfgang Woess
Johannes Kepler University Linz	W1214	Peter Paule
Innsbruck Medical University	W11	Bernhard Flucher

Rectors, Vice Rectors, and Deans of Austrian universities

University	Function	Name
University of Vienna	Rector	Heinz W. Engl
	Vice Rector for Research	Susanne Weigelin-Schwiedrzik
Medical University of Vienna	Vice Rector for Research	Markus Müller
University of Veterinary Medicine Vienna	Rector	Sonja Hammerschmid
	Vice Rector for Research	Otto Doblhoff-Dier
Vienna University of Technology	Vice Rector for Research	Johannes Fröhlich
Graz University of Technology	Vice Rector for Research	Horst Bischof
Medical University of Graz	Vice Dean for Doctoral Programms	Andrea Olschewski
Alpen-Adria-Universität Klagenfurt	Vice Dean	Wilhelm Berger

Experts

University	Function	Name
Medical University of Graz	Department for Research Documentation and Evaluation	Peter Schaffer
Alpen-Adria-Universität Klagenfurt	University Professor for Higher Education Research	Hans Pechar
German Research Foundation	Department of Research Careers, Deputy	Sabine Mönkemöller

Representatives of the national higher education policy

Ministry	Function	Name
Federal Ministry of Science, Research and Economy	Director General	Elmar Pichl
Federal Ministry of Science, Research and Economy	Director General	Barbara Weitgruber

National association of doctoral students and representatives of centers for doctoral studies

University	Function	Name
University of Vienna	Head of the Center for Doctoral Studies	Lucas Zinner
University of Graz	Head of DocService	Gerald Lind
Vienna University of Economics and Business	Doctoral Office	Barbara Bauer
Vienna University of Technology	PhD student body	René Mayer
	Platform for doctoral candidates (doktorat.at)	represented by René Mayer

FWF Management

Function	Name
President (untill 2013)	Christoph Kratky
Managing Director	Dorothea Sturn
Programme Management DK	Sabine Haubenwallner
Programme Management DK	Birgit Woitech
Programme Management Evaluation and Strategy Development	Klaus Zinöcker

Interview partner in the international comparison

Country	Function	Name
The Netherlands	Programme Officer, NWO	Sjoerd Meihuizen
Germany	Head, Graduiertenkollegs, Graduierenschulen, Research Careers Division, DFG	Annette Schmidtman
Switzerland	Programme Officer, CRUS	Noëmi Eglin-Chappuis
Norway	Senior Adviser, The Norwegian Association of Higher Education Institutions (UHR)	Ragnar Lie
	Deputy Director General, Ministry of Education and Research	JanaWeidemann
Finland	Counsellor of Education, Ministry of Education, Higher Education and Science Policy	Erja Heikkinen
	President of the Academy of Finland	Heikki Mannila
Denmark	Ministry for Research, Innovation and Higher Education, Section for Universities and Internationalisation	Signe Nielsen

Appendix III Activities and initiatives in doctoral training at Austrian universities according to the performance agreements 2013-2015

<p>Universität Wien</p>	<p>Strategische Ziele</p> <ul style="list-style-type: none"> • Zur Unterstützung dieser Ausrichtung wird in der kommenden Leistungsvereinbarungsperiode das auf Interdisziplinarität ausgerichtete Instrument der Forschungsplattformen weiter entwickelt und die Kapazität der Universität im Bereich der kompetitiven und neugierdegeleiteten Forschung im Bereich der Doktoratsprojekte ausgebaut. • Qualitätsentwicklung Doktoratsstudium <p>Förderung des wissenschaftlichen Nachwuchses als Teil der Forschungsstrategie</p> <ul style="list-style-type: none"> • Weiterführung von Doktoratskollegs • Möglichkeiten der individuellen DoktorandInnenförderung vermehren → Damit soll die neugierdegeleitete Forschung der jungen WissenschaftlerInnen unabhängig von den in strukturierten Doktoratsprogrammen vorgegebenen Themenfeldern stärker als bisher gefördert werden. Die DoktorandInnen sollen jedenfalls in einem hochkompetitiven Verfahren, an dem BewerberInnen von außerhalb gleichberechtigt mit AbsolventInnen der Universität Wien teilnehmen, ausgewählt werden. Im Sinne des Gender Mainstreamings wird bei den individuellen DoktorandInnenförderungen darauf geachtet werden, dass die Anzahl der geförderten Doktorandinnen etwa dem prozentualen Anteil der von Frauen gestellten Anträge entspricht. Weitere Details zu individueller DoktorandInnenförderung und zu den Vienna Doctoral Academies können entsprechenden Hintergrunddokumenten entnommen werden. Im Sinne einer institutionellen Verankerung der DoktorandInnenförderung ist der Aufbau von University of Vienna Doctoral Academies vorgesehen (siehe Vorhaben B.4.1). <p>Vorhaben zu Forschungsleistungen (insbesondere Innovationen & Veränderungen)</p> <ul style="list-style-type: none"> • Aufbau von University of Vienna Doctoral Academies (VDA) → Konzeptionierung = Meilenstein bis 2015 • Das DoktorandInnenzentrum wird stärker an das Forschungsservice angebunden • Analyse der Wirksamkeit strukturierter Doktoratsprogramme (Analyse der Karriereverläufe) <p>Ziele zu Forschungsleistungen</p> <ul style="list-style-type: none"> • Beteiligung an strukturierten DK Programmen von 25 auf 20 bis 2015 reduzieren: u.a. Programme des FWFs (Anmerkung: Einerseits sind diese Programme von der FWF-Overhead Regelung ausgenommen und andererseits wird seitens des Fördergebers zusätzliches finanzielles Engagement der beantragenden Universitäten gefordert). • Anzahl der individuell geförderten DoktorandInnen im Rahmen der VDA Ziel bis 2015= 30
<p>Universität Graz</p>	<p>Strategische Ziele</p> <ul style="list-style-type: none"> • Für das Erreichen des Forschungsprofils sind u.a. Doktoratskollegs geplant. • Einrichtung eines Doktoratsstudiums für AbsolventInnen von Lehramtsstudien (Schwerpunkt pädagogische Berufe) → im Entstehen Doktoratsschule für Fachdidaktik <p>Forschung</p> <ul style="list-style-type: none"> • Wiss. Nachwuchs soll verstärkt durch strukturierte Doktoratsausbildung gefördert werden <p>Forschungsleistungen</p> <ul style="list-style-type: none"> • Ziel bis 2020: 80% der Studierenden in strukturierten Doktoratsprogrammen • An den Fakultäten haben sich 14 Doktoratsprogramme als Zusammenschluss von Habilitierten gleicher, ähnlicher oder gänzlich unterschiedlicher Fachbereiche, die im Rahmen dieses Programms ein hochwertiges und attraktives Zusatzangebot für eine begrenzte Anzahl von Doktoratsstudierenden bieten, etabliert. • Es wurden 11 Doktoratsschulen eingerichtet, die als spezielle Leistungsbereiche alle Studierenden im Rahmen des jeweiligen Doktoratsstudiums fachlich strukturiert betreuen und ausbilden. • 11 FWF DK • Zusätzliche Professuren für DK und Forschungsschwerpunkte • Neben der Stärkung der Forschung in NAWI Graz werden mit BioTechMed weitere Forschungsoperationen aufgebaut, in welchen ein besonderer Fokus auf die Einbindung von Jungforscherinnen in interdisziplinären Doktorats- und Postdocprogrammen gelegt wird. • Aufbau von weiteren Doktoratsprogrammen, -schulen und -kollegs geplant • Aufbau Klimaforschung → Forschungsschwerpunkt Umwelt und globaler Wandel; Doktoratsschule und Doktoratsprogramm werden entwickelt.
<p>Universität Innsbruck</p>	<p>Strategische Ziele</p> <ul style="list-style-type: none"> • Förderung von intern finanzierten DK <p>Forschung</p> <ul style="list-style-type: none"> • Drei im Jahr 2011 bewilligte intern geförderte DoktorandInnenkollegs, die interdisziplinär orientiert sind <p>Vorhaben</p> <ul style="list-style-type: none"> • Ausbau der intern finanzierten Dissertationsstipendien

	<ul style="list-style-type: none"> • Weiterführung des intern finanzierten DK • Adaptierung der curricularen u. organisatorischen Ausgestaltung der Doktoratsstudien <p>Ziele</p> <ul style="list-style-type: none"> • NachwuchsforscherInnen über DK gefördert: 2011=0, 2013= 10, 2014=13, 2015=16. <p>Kooperationen</p> <ul style="list-style-type: none"> • Interuniversitäres und interdisziplinäres Doktoratskolleg des Austrian Center for Limnology (AOL) mit Uni Wien, BOKU Wien, Uni Salzburg, Uni Graz → Entwicklung eines Konzepts bis Ende 2014 • Doktoratsschule öffentliches Wirtschaftsrecht: Stipendienfinanzierte kooperative Doktoratsschule (UniGraz, UniSalzburg) → 2013 Konzeption, Stipendienausschreibung und Vergabe von 2 österreichweiten Doktoratsseminaren; 2014 & 2015 Abhaltung von 2 österreichweiten Doktoratsseminaren • Kompetenznetzwerk universitäre und außeruniversitäre Sozialforschung (SOZNET)(Graz, Innsbruck, Linz, Salzburg, Wien, FORBA und SORA) → 1 Doktoratsprogramm geplant
Medizinische Universität Wien	<p>Doktoratsstudien sollen nur mehr in Form von englisch-sprachigen PhD-Curricula geführt werden.</p>
Medizinische Universität Graz	<p>Forschung</p> <p>Verbindung zw. Forschung und Lehre in Doktoratsprogrammen → Forschungstätigkeit als integraler Bestandteil des Studiums</p> <p>PhD Programme:</p> <ul style="list-style-type: none"> • MolMed (Molecular Medicine) • Brain Ageing (Neuroscience) • DK-MCD (FWF-DKplus Metabolic and Cardiovascular Disease) • DK-MOLIN (FWF-DKplus in Molecular Inflammation) <p>Doctoral Schools im Rahmen des Doktoratsstudiums der Medizinischen Wissenschaften (= größere Fachgebiete, die nach Maßgabe des Studienplans für ein qualitativ hochwertiges Ausbildungsprogramm verantwortlich sind):</p> <ul style="list-style-type: none"> • Lifestyle-Related Diseases (LIFEMED) • Cardiovascular Research/Kardiovaskuläre Forschung (CARDIOMED) • General and Clinical Pathophysiology (PATHMED) • Molecular Medicine and Inflammation • Translational Molecular and Cellular Biosciences • Zahn-, Mund- und Kieferheilkunde • Sustainable Health Research • Knochen, Muskel und Gelenke <p>Förderung Nachwuchs</p> <ul style="list-style-type: none"> • „Startförderung“ für Forschungsprojekte junger WissenschaftlerInnen <p>BIOTECHMED</p> <p>Im Bereich der Lehre sollen gemeinsame Doktoratskollegs etabliert werden und eine Abstimmung der Lehre innerhalb BioTechMed an den Partneruniversitäten erfolgen.</p>
Medizinische Universität Innsbruck	<p>Forschung</p> <ul style="list-style-type: none"> • Signifikante Forschungsmittel wurden zur Finanzierung von zwei mittels FWF geförderten Doktoratskollegs und Spezialforschungsbereichen (SFB) zur Verfügung gestellt. Neben diesen zwei PhDs-Stellen sollten zumindest ansatzweise derartige PhD-Stellen intramural und kompetitiv auch für andere Wissenschaftsbereiche vergeben werden. • PhD Programme als wesentliche Maßnahme zur Optimierung der Forschungsstruktur der Universität - Orientierung an internationalen Standards • 9 PhD Programme an der MUI • 2 FWF DK, welche zusätzlich durch Beiträge aus dem Globalhaushalt für Doktorandenstellen kofinanziert werden. <p>Vorhaben</p> <ul style="list-style-type: none"> • Förderlinie MUI Start - PhD-Stellen für die Doktoratsprogramme: Insgesamt sollen 6 PhD-Stellen für jeweils 3 Jahre kompetitiv vergeben werden. • Zusatzfinanzierung neu zu beantragender DK/SFBs <p>Kooperationen</p> <ul style="list-style-type: none"> • Geplantes Doktoratskolleg in Bioinformatik (Med Uni Graz und Wien, Uni Wien, BOKU)
Universität Salzburg	<p>Personalentwicklung</p> <ul style="list-style-type: none"> • Derzeit 5 DK (davon 3 FWF DK) • Ausbau der drei Forschungsschwerpunkte: Öffentliches Wirtschaftsrecht, Wissenschaft & Kunst, School of Education • Ziele: Weiterführung und Verbesserung der Doktoratsausbildung in Form von DK sowie die Ausweitung von DK • 2014 ACL Antrag geplant

	<ul style="list-style-type: none"> • 2015 Immunity in Cancer and Allergy (FWF) Beantragung auf Verlängerung (läuft 2013 aus) <p>Forschung</p> <p>Einwerbung drittmittelfinanzierter Großprojekte, an deren Finanzierung sich die Universität durch jeweils beträchtliche Eigenleistungen beteiligt. Hier sind zu nennen:</p> <ul style="list-style-type: none"> • FWF-Doktoratskolleg Geographic Information Science (Interfakultärer Fachbereich Geoinformatik – Z_GIS) • FWF-Doktoratskolleg Imaging the Mind (Fachbereich Psychologie) • FWF-Doktoratskolleg Immunity in Cancer and Allergy (Schwerpunkt Biowissenschaften und Gesundheit) • FWF-Spezialforschungsbereich Molecular Mechanisms of Allergenicity (in Begutachtung, Schwerpunkt Biowissenschaften und Gesundheit) <p>Kooperationen</p> <ul style="list-style-type: none"> • Fortsetzung und weiterer Ausbau des gemeinsamen Schwerpunktes „Wissenschaft & Kunst“ mit Mozarteum, vor allem Fortsetzung des Doktoratskollegs; • SOZNET umfasst fünf Universitäten (Graz, Innsbruck, Linz, Salzburg, Wien), zwei außeruniversitäre Forschungsinstitute, Kompetenznetzwerk (FORBA und SORA) → Doktoratsprogramm geplant
Technische Universität Wien	<p>Strategisches Ziel</p> <ul style="list-style-type: none"> • Nachwuchsförderung: Vergabe von TU-internen DoktoratskollegiatInnenstellen <p>Forschung</p> <ul style="list-style-type: none"> • Durchführung strukturierter Doktoratskollegs: Diese werden kompetitiv vergeben und haben eine Laufzeit von drei Jahren. Sie bestehen aus jeweils 5 bis 10 Betreuenden (Faculty) und 7 bis 10 Studierenden (KollegiatInnen). <p>Schwerpunktprogramme</p> <ul style="list-style-type: none"> • 5 Spezial-Forschungsbereichen (SFB) • 6 Nationale Forschungsnetzwerke (NEN) • 4 Doktoratskollegs (DK) des FWF • 2 Programme zur Entwicklung und Erschließung der Kunste (PEEK) <p>Kooperationen</p> <ul style="list-style-type: none"> • Einreichung für ein FWF DK „Joint-Degree-PhD“ in Architektur gemeinsam mit der Angewandten Wien
Technische Universität Graz	<p>Schwerpunkt „Internationalisierung des Studienangebotes“: 13 englischsprachige Doctoral Schools mit dem Ziel, die Mobilität, interkulturelle Kompetenzen und die Wettbewerbsfähigkeit der AbsolventInnen zu fördern</p>
Montanuniversität Leoben	keine Information in LV
Universität für Bodenkultur Wien	<p>Forschung</p> <ul style="list-style-type: none"> • Ausbau von klassischen Doktoraten hin zu strukturierten Doktoratsprogrammen (Doktoratskollegs, Graduiertenschulen) • Weitere Doktoratskollegs sind für die LV 201 3-2015 in Vorbereitung <p>Vorhaben</p> <ul style="list-style-type: none"> • Bereits 2009 wurde das „BOKU Docs“-Programm zur Förderung von besonders begabten NachwuchswissenschaftlerInnen gestartet. Im Zuge einer universitätsinternen Ausschreibung wurden 2009 und 2010 exzellenten Studierenden Dissertationsstipendien für 3 Jahre in einem der inhaltlichen Schwerpunktbereiche der BOKU zuerkannt. Das Auswahlverfahren für die eingereichten Dissertationsprojekte orientiert sich sehr stark an jenem des FWF. Es wurde durch den BOKU-Beirat nach hohen Qualitätsstandards unter Einbeziehung von je zwei internationalen GutachterInnen abgewickelt. Dieses Programm, welches 2011 und 2012 aus budgetären Gründen (auf Grund des Wegfalls der FWF-Overheads) unterbrochen war, wird in der neuen Leistungsvereinbarungsperiode wieder weiter geführt werden, sobald durch die FWF-Overheads ausreichend Budget verfügbar ist. • Ausbildung im Rahmen zusätzlicher kompetitiv eingeworbener Doktoratskollegs (1 DK Antrag pro Jahr) • Bio-Resources & Technologies: Einreichung eines DK geplant • Beantragung Doktoratskolleg Nanobiotechnology and Bioprocess Engineering
Veterinärmedizinische Universität Wien	keine Information in LV
Wirtschaftsuniversität Wien	keine Information in LV
Universität Linz	<p>Forschung</p> <ul style="list-style-type: none"> • Steigerung der Anzahl an DK in Kooperation mit anderen österreichischen Universitäten • Neuer PhD-Studiengang „Computational Mathematics & Computer Science“ <p>Kooperationen</p> <ul style="list-style-type: none"> • DK Bioinformatik: Kooperation zwischen Medizinischen Universitäten Graz, Innsbruck und Wien, der Universitäten Wien und Linz sowie der BOKU → Umsetzung für 2013 geplant

<p>Universität Klagenfurt</p>	<p>Forschung</p> <p>Neues Curriculum für Doktoratsstudien mit folgende Neuerungen:</p> <ul style="list-style-type: none"> • Universitätsöffentliche Präsentationen der Dissertationsvorhaben • Dissertationsvereinbarung • Teilweise Entkoppelung von Betreuung und Begutachtung, Hinzuziehung externer, auch internationaler Expertise (GutachterInnen) • Aufbau eigener Doktoratsprogramme zu den Fakultätsschwerpunkten • Stipendien <p>Ziele des neuen Curriculums:</p> <ul style="list-style-type: none"> • Aufbau von Doktorandinnenkollegs wie bei IFF entlang der Forschungsschwerpunkte der Fakultäten und auch entlang der interfakultären Forschungsthemen • DK an Fakultäten: Erasmus-Mundus-Doktoratsprogramm ICE (mit Partnern in Barcelona, Eindhoven, Genua und London)
<p>Universität für angewandte Kunst Wien</p>	<p>Vorhaben</p> <ul style="list-style-type: none"> • Das „Art Education“ Promotionsprogramm in Kooperation mit der Züricher Hochschule der Künste wurde 2011 um die Carl von Ossietzky-Universität Oldenburg erweitert. Dieses Modell könnte auch für weitere Forschungsszenarien eine Grundlage bieten. • Arbeitsgruppe Kunst und Forschung: 2013 Einrichtung des Forschungsfeldes; künstl. Doktorat online Plattform 2014, Forschungskolloquien 2015 • Künstlerisch-forschendes Doktorat: Curricula Entwicklung bis 2014 • Projekt Joint Degree PhD Architektur als FWF DK gemeinsam mit TU Wien: Umsetzung für 2015 geplant • Erhöhung der Studienplätze zur Realisierung von künstlerisch-forschend orientierten Projektvorhaben
<p>Universität für Musik und darstellende Kunst Wien</p>	<p>keine Information in LV</p>
<p>Universität Mozarteum Salzburg</p>	<p>Personal</p> <ul style="list-style-type: none"> • In Kooperation mit Universität Salzburg ist im Schwerpunkt „Wissenschaft und Kunst“ ein DK (WS 2010 - SS 2013) zum Thema Kunst und Öffentlichkeit eingerichtet (5 DoktorandInnen). <p>Vorhaben</p> <ul style="list-style-type: none"> • Einrichtung von künstlerischen Doktoratsstudien (Dr. artium); diese sollen ein gleichberechtigter Grad zum PhD werden, Umsetzung in 2015 geplant • Einrichtung eines wissenschaftlich-künstlerischen Doktoratsstudiums „Theorie und Praxis der Künste“: gemeinsam mit Universität Salzburg, Umsetzung in 2015 geplant
<p>Universität für Musik und darstellende Kunst Graz</p>	<p>Forschung</p> <ul style="list-style-type: none"> • Gründung einer Doktoratsschule für ein künstlerisches Doktorat • Für die Jahre 2012-2016 plant die KUG die künstlerischen Forschungsaktivitäten institutionell stärker zu bündeln und mit der Doktoratsschule zu vernetzen. <p>Personal</p> <ul style="list-style-type: none"> • Gezielte Förderung von Doktoratsstudierenden, stufenweiser Aufbau eines Förderprogramms <p>Forschung</p> <ul style="list-style-type: none"> • Einführung neuer Doktoratsprogramme, welche PhD wertig sind (3-jährig strukturierte Programme)
<p>Universität für künstlerische und industrielle Gestaltung Linz</p>	<p>keine Information in LV</p>
<p>Akademie der bildenden Künste Wien</p>	<p>Strategische Ziele</p> <ul style="list-style-type: none"> • Joint Degree PhD Architektur mit der TU Wien und der Angewandten als FWF DK • Entwicklung eines künstlerischen Doktoratsstudiums (Doktorat Dr. art): ein Doktorat, ohne wissenschaftliche Arbeit zu verfassen; geplant für 2015: Konzeption und Koordinierungsgespräche zwischen Universität und politischen EntscheidungsträgerInnen <p>Kooperationen/Vorhaben</p> <ul style="list-style-type: none"> • Uni Zagreb (strukturierte Doktoratsausbildung)

Source: Performance Agreements 2013-2015 with the BMWF

Appendix IV Current activities and initiatives of structured doctoral training at Austrian universities

University of Vienna	Initiative
Archäologische Prospektion	Initiativkolleg
Bioaktivitätscharakterisierung und Metabolismus	Initiativkolleg
Computergestützte Optimierung	Initiativkolleg
Computational Science	Initiativkolleg
Deformation in Geomaterialien	Initiativkolleg
Kulturtransfer im Grenzgebiet des Himalaya	Initiativkolleg
Functional Molecules	Initiativkolleg
Empowerment through Human Rights	Initiativkolleg
Planetology: From Asteroids to Impact Craters	Initiativkolleg
European Historical Dictatorship and Transformation Research	Initiativkolleg
Gender, Violence and Agency in the Era of Globalization	Initiativkolleg
University of Graz	
Biologie	Doktoratsschule
Chemie	Doktoratsschule
Erdwissenschaften	Doktoratsschule
Mathematik und Wissenschaftliches Rechnen	Doktoratsschule
Molekularbiologie und Biochemie	Doktoratsschule
Pharmazie	Doktoratsschule
Psychologie	Doktoratsschule
Physik	Doktoratsschule
Geographie und Raumforschung	Doktoratsschule
Umweltsystemwissenschaften	Doktoratsschule
Sport- und Bewegungswissenschaften	Doktoratsschule
Erziehungswissenschaften	Doktoratsschule
Fachdidaktik	Doktoratsschule
Doctoral School Geosciences/Doktoratsschule Geowissenschaften	Doktoratsschule
Antike Kulturen des Mittelmeerraumes	Doktoratsprogramm
Fachdidaktik für das Unterrichtsfach Geschichte, Sozialkunde und Politische Bildung	Doktoratsprogramm
Interdisziplinäre Geschlechterstudien	Doktoratsprogramm
Kultur - Text - Handlung	Doktoratsprogramm
Menschenrechte und Demokratie	Doktoratsprogramm
Migration – Diversität – Globale Gesellschaften	Doktoratsprogramm
Sammeln, Ordnen, Vermitteln. Wissenskulturen im 18. Jahrhundert	Doktoratsprogramm
Südöstliches Europa	Doktoratsprogramm
Philosophie (Interfakultäres Doktoratsprogramm Philosophie)	Doktoratsprogramm
Visual Culture/Visuelle Kultur	Doktoratsprogramm
Sprachdidaktik und Sprachlehr-/lernforschung	Doktoratsprogramm
Top Performance Processes (TPP)	Doktoratsprogramm
Vergleichende Gesellschaftsanalyse im internationalen Kontext	Doktoratsprogramm
Geschichte und Soziologie der Sozialwissenschaften	Doktoratsprogramm
Öffentliches Recht und Politikwissenschaft,	Doktoratsprogramm
Europäisches Privatrecht,	Doktoratsprogramm

University of Innsbruck	
Sport und Recht	DoktorandInnenkolleg
Arts and Politics	DoktorandInnenkolleg
Figuration "Gegenkultur"	DoktorandInnenkolleg
Medical University of Graz	
Molecular Medicine	PhD Programme
Neurosciences	PhD Programme
Lifestyle-Related Diseases (LIFEMED)	Doctoral School
Cardiovascular Research/Kardiovaskuläre Forschung (CARDIOMED)	Doctoral School
General and Clinical Pathophysiology (PATHMED)	Doctoral School
Molecular Medicine and Inflammation	Doctoral School
Translational Molecular and Cellular Biosciences	Doctoral School
Zahn-, Mund- und Kieferheilkunde	Doctoral School
Sustainable Health Research	Doctoral School
Knochen, Muskel und Gelenke	Doctoral School
Innsbruck Medical University	
Molecular Oncology	PhD Programme
Molecular Cell Biology	PhD Programme
Neuroscience	PhD Programme
Aging of Biological Communication Systems	PhD Programme
Regulation of gene expression during growth, development and differentiation	PhD Programme
Infectious diseases: Molecular mechanisms	PhD Programme
Image-guided diagnosis and therapy	PhD Programme
Musculoskeletal sciences	PhD Programme
Genetics and Genomics	PhD Programme
University of Salzburg	
European Union Studies	Doktoratskolleg
Wissenschaft & Kunst	Doktoratskolleg
PLUS School of Education	Doktoratskolleg
Kunst und Öffentlichkeit	Doktoratskolleg
SCEUS/Boundaries of Europe	Doktoratskolleg
Vienna University of Technology	
AB-Tec Applied Bioscience Technology	DoktorandInnenkolleg
Catalysis Materials and Technology	DoktorandInnenkolleg
Computational Perception	DoktorandInnenkolleg
ENSYS Energiesysteme 2030	DoktorandInnenkolleg
Functional Matter	DoktorandInnenkolleg
Mathematical Logic in Computer Science	DoktorandInnenkolleg
Vienna Graduate School on Computational Materials Science	DoktorandInnenkolleg
Adaptive Distributed Systems	DoktorandInnenkolleg
Environmental Informatics	DoktorandInnenkolleg
MEIBio Molecular and Elemental Imaging in Bioscience	DoktorandInnenkolleg
EWARD Energiebewusste Stadt- und Regionalentwicklung	DoktorandInnenkolleg
URBEM Urbanes Energie- und Mobilitätssystem	DoktorandInnenkolleg
Vienna PhD School of Informatics	PhD School
Graz University of Technology	
Architektur	Doctoral School
Bauingenieurwissenschaften	Doctoral School
Chemie (NAWI Graz)	Doctoral School

Elektrotechnik - Biomedical Engineering	Doctoral School
Geosciences	Doctoral School
Informatik	Doctoral School
Informations- und Kommunikationstechnik	Doctoral School
Maschinenbau	Doctoral School
Mathematik und Wissenschaftliches Rechnen (NAWI Graz)	Doctoral School
Molekulare Biowissenschaften und Biotechnologie (NAWI Graz)	Doctoral School
Techno-Ökonomie	Doctoral School
Physik (NAWI Graz)	Doctoral School
Verfahrenstechnik	Doctoral School
Joint Doctoral Programme Geo-Engineering and Water Management	Doctoral Programme
University of Natural Resources and Life Sciences, Vienna	
Nachhaltige Entwicklung	Doktoratskolleg
International Graduate School in Nanobiotechnology (IGS-NanoBio)	Doctoral College
University of Veterinary Medicine Vienna	
Modulation of the porcine immune system by host-specific infections	Doctoral Programme
Biological responses to environmental challenges (BIOREC)	Doctoral Programme
Vienna University of Economics and Business	
Wirtschafts- und Sozialwissenschaften	PhD Programme
Johannes Kepler University Linz	
Economics	PhD Programme
Alpen-Adria-Universität Klagenfurt	
Doctoral School Social Ecology (DSSE)	DoktorandInnenkolleg
Organisationsentwicklung	DoktorandInnenkolleg
Palliative Care und Organisationsethik	DoktorandInnenkolleg
Wissenschaften und Hochschulen in der Wissensgesellschaft	DoktorandInnenkolleg
Interdisziplinäres DoktorandInnenkolleg Interventionsforschung	DoktorandInnenkolleg
Technik- und Wissenschaftsforschung	DoktorandInnenkolleg
Lifelong Learning	DoktorandInnenkolleg
Kulturwissenschaftliches Doktoratskolleg	DoktorandInnenkolleg
Gender Studies (in Vorbereitung)	DoktorandInnenkolleg
Didaktik der Mathematik	DoktorandInnenkolleg
University of Music and Performing Arts Graz	
Künstlerisches Doktoratsstudium	Doctoral School
Wissenschaftliches Doktoratsstudium	Doctoral School
Medical University of Vienna	
Applied Medical Science	Doctoral Programme (PhD)
Doctor of Philosophy	PhD Programme

Source: Internet research

Appendix V Data sources of the international comparison

Data on doctoral students and graduates in the European countries under review have been retrieved from the following websites:

The Netherlands

- http://www.vsnu.nl/f_c_promovendi.html (also link to excel files with numbers on doctoral candidates and graduation rates).
- <http://www.cbs.nl>.
- <http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLNL&PA=71247ned&LA=NL> (gepromoverden an universiteiten).

Germany

- Statistisches Bundesamt (2012): Promovierende in Deutschland, 2010, Wiesbaden, download: https://www.destatis.de/DE/Publikationen/Thematisch/BildungForschungKultur/Hochschulen/Promovierend_e5213104109004.pdf?__blob=publicationFile.

Switzerland

- <http://www.bfs.admin.ch/bfs/portal/de/index/themen/15/06/tab/blank/uebersicht.html>.

Norway

- Data taken from NIFU Report 25/2012: PhD education in a knowledge society.

Finland

- Statistical Yearbook Finland 2013: Section on Education, http://pxweb2.stat.fi/sahkoiset_julkaisut/vuosikirja2013/html/engl0003.htm.

Denmark

- Statbank from Statistics Denmark: Enrolments and graduates in doctoral studies, <http://www.statbank.dk/AFGANG04>.

Appendix VI List of FWF Doktoratskollegs established 2004-2013

DK No.	Titel	Principal Investigator	University
W09	Structure, Function and Biotechnological Exploitation of Enzymes	Ellen L. Zechner	University of Graz
W10	Vienna Graduate School of Finance	Josef Zechner	University of Vienna
W11	Molecular Cell Biology and Oncology	Bernhard E. Flucher	Innsbruck Medical University
W1201	Molecular Bioanalytics	Peter Pohl	Johannes Kepler University Linz
W1203	Hadrons in Vacuum, Nuclei and Stars	Christof Gatteringer	University of Graz
W1204	Austrian Galicia and its Multicultural Heritage	Woldan Alois	University of Vienna
W1205	Cell Communication in Health and Disease	Böhm Stefan	Medical University of Vienna
W1206	Signal Processing in Neurons	Georg Dechant	Innsbruck Medical University
W1207	RNA Biology	Andrea Barta	Medical University of Vienna
W1208	Numerical Simulations in Technical Sciences	Olaf Steinbach	Graz University of Technology
W1209	Confluence of Vision and Graphics	Horst Bischof	Graz University of Technology
W1210	Complex Quantum Systems	Markus Arndt	University of Vienna
W1212	Inflammation and Immunity	Maria Sabilia	Medical University of Vienna
W1213	Immunity in Cancer & Allergy	Josef Thalhammer	University of Salzburg
W1214	Computational Mathematics: Numerical Analysis and Symbolic Computation	Peter Paule	Johannes Kepler University Linz
W1219	Vienna Doctoral Programme on Water Resource Systems	Günter Blöschl	Vienna University of Technology
W1220	Molecular Mechanisms of Cell Signalling	Manuela Baccharini	University of Vienna
W1221	Structure and Interaction of Biological Macromolecules	Timothy Skern	Medical University of Vienna
W1224	Biomolecular Technology of Proteins	Christian Obinger	University of Natural Resources and Life Sciences, Vienna
W1225	Population Genetics	Christian Schlötterer	University of Veterinary Medicine Vienna
W1226	Metabolic and Cardiovascular Disease	Gerald Höfler	Medical University of Graz
W1227	Computational Interdisciplinary Modelling	Sabine Schindler	University of Innsbruck
W1228	The Sciences in Historical, Philosophical and Cultural Contexts	Mitchell G. Ash	University of Vienna
W1229	Doctoral Program in Accounting, Reporting, and Taxation	Alfred Wagenhofer	University of Graz
W1230	Discrete Mathematics	Wolfgang Woess	Graz University of Technology
W1231	Vienna Graduate School of Economics	Maarten Janssen	University of Vienna
W1232	Molecular Drug Targets	Steffen Hering	University of Vienna
W1233	Imaging the Mind: consciousness, higher mental and social processes	Josef Perner	University of Salzburg
W1234	Cognition and Communication	Thomas Bugnyar	University of Vienna
W1235	International Business Taxation	Michael Lang	Vienna University of Economics and Business
W1237	Geographic Information Science. Integrating interdisciplinary concepts and methods	Thomas Blaschke	University of Salzburg
W1238	Chromosome Dynamics	Peter Schlögelhofer	University of Vienna
W1241	Molecular Fundamentals of Inflammation	Akos Heinemann	Medical University of Graz
W1243	Building Solids for Function	Ulrich Schubert	Vienna University of Technology
W1244	Partial Differential Equations - Modelling, Analysis, Numerical Methods and Optimization	Karl Kunisch	University of Graz

W1245	Dissipation and Dispersion in Nonlinear Partial Differential Equations	Ansgar Jüngl	Vienna University of Technology
W1248	Molecular, Cellular and Clinical Allergology	Winfried Pickl	Medical University of Vienna

Source: FWF Database

Appendix VII FWF DK Programme Guidelines



Der Wissenschaftsfonds.

Haus der Forschung

1090 Wien, Sensengasse 1
T: +43/1/505 67 40 F: +43/1/505 67 39
office@fwf.ac.at / <http://www.fwf.ac.at>

In Ausführung seiner Förderungsrichtlinien vom 21. Februar 2006 (in der geltenden Fassung) formuliert der FWF folgende

Antragsrichtlinien⁶³ zur Erstellung eines Doktoratskollegs (DK) -Konzeptes für die Vorbegutachtung im Rahmen des Doktoratsprogramms

Was kann beantragt werden?

Die Finanzierung eines Ausbildungszentrums/eines Doktoratskolleg (DK) für den wissenschaftlichen Spitzennachwuchs von internationalem Rang und hoher internationaler Sichtbarkeit auf dem Gebiet der nicht auf Gewinn gerichteten wissenschaftlichen Forschung an wissenschaftlichen Forschungsstätten mit Promotionsrecht (Universitäten und I.S.T. Austria) im Sinn der Ziele und Vorgaben des Doktoratsprogramms.

Wer kann beantragen?

Alle beim FWF antragsberechtigten WissenschaftlerInnen, die über das Potenzial und die Möglichkeiten verfügen, an österreichischen Forschungsstätten mit Promotionsrecht ein Ausbildungszentrum (bestehend aus Forschungs- und Ausbildungseinheit) im Sinn der DK Programmziele aufzubauen und zu tragen. Die Antragstellung kann nur durch eine einzelne „natürliche Person“ erfolgen. „Juristische Personen“, wie Institute, Institutionen oder Firmen sind nicht antragsberechtigt. Das Projekt muss in Österreich durchgeführt werden.

Ein/e in Österreich tätige WissenschaftlerIn (=AntragstellerIn des Konzeptantrages) muss als SprecherIn eines Konsortiums auftreten, das den Konzeptantrag formuliert hat und inkl. SprecherIn aus mindestens 5, maximal aber 20 Faculty Members (=WissenschaftlerInnen) besteht. Der/die SprecherIn repräsentiert das DK nach außen, betreut selbst DoktorandInnen und unterfertigt den Förderungsvertrag mit dem FWF wie auch den Vertrag mit den Forschungsstätten mit Promotionsrecht, der die Zugeständnisse der Forschungsstätte/n bezogen auf Personal und Infrastruktur regelt.

Die Faculty Members (inkl. SprecherIn) treten als LeiterInnen von Projekt-/Forschungsbereichen auf und zeichnen jede/r zumindest für einen wissenschaftlichen Forschungsbereich verantwortlich (diese Verantwortung kann nicht geteilt werden).

Grundsätzlich soll ein DK das Standortprinzip erfüllen und an einem Forschungsstandort verankert sein. Als Forschungsstandort gilt in der Regel eine Universitätsstadt. Die Verankerung des DK ist ausschließlich an Forschungsstätten mit Promotionsrecht möglich. Bei einer gewünschten Integration von Faculty Members, die nicht zu 100% in Österreich tätig sind, ist es notwendig die aktuellen Vorgaben vor der Antragseinreichung beim FWF zu erfragen.

Die wissenschaftliche Qualifikation zur Projektdurchführung ist durch internationale Fachpublikationen zu belegen (in einer dem Karriereverlauf entsprechenden Anzahl). Aufgrund der ausschließlich internationa-

⁶³ Bitte beachten: Maximalvorgaben (im Hinblick auf z.B. Seitenzahlen, Publikationen und Beilagen) sind unbedingt einzuhalten.

len Begutachtung geht der FWF in der Regel von internationalen und/oder referierten Publikationen aus, die über den deutschen Sprachraum hinausreichen. Ausnahmen müssen begründet werden.

Die tragende Forschungsstätte mit Promotionsrecht muss im Rahmen der Vorbegutachtung eine Unterstützungserklärung für das Projekt abgeben und im Rahmen des Vollertrags dann gegebenenfalls Ihr Commitment darstellen.

Geschlechterverhältnis: Ein Programmziel des DK ist die Erhöhung des Frauenanteils in der österreichischen Spitzenforschung. Falls weniger als 30% Frauen am beantragenden Konsortium als Faculty Member beteiligt sind, muss eine Begründung erfolgen (z.B. im Rahmen der Beschreibung der beteiligten WissenschaftlerInnen).

Mehrfachbeteiligungen: Konsortiumsmitglieder von DK dürfen sich an beliebig vielen Doktoratskollegs (DK) beteiligen.

Bei der Beteiligung an mehreren DK gelten folgende Einschränkungen (siehe auch Anhang I S. 7):

- Personalkosten (=Dienstverträge für DoktorandInnen) und Kosten für Verbrauchsmaterial können nur in zwei DK (einem nationalen und einem internationalen DK) beantragt werden.
- Ausbildungskosten (sonstige Kosten) für DoktorandInnen können in maximal drei DK (zwei nationalen und einem internationalen DK) beantragt werden.
- In jedem weiteren DK dürfen weder Personal/Material- noch sonstige Kosten beantragt werden.

Die Funktion einer Sprecherin/eines Sprechers kann aber nur in jeweils einem DK wahrgenommen werden. Die Ausübung einer weiteren SprecherInnenfunktion z.B. in einem Spezialforschungsbereich (SFB) ist nicht möglich.

Konsortiums- bzw. Faculty Mitglieder dürfen sich an maximal drei Schwerpunkt-Programmen beteiligen. Drei Schwerpunkt-Programmbeteiligungen sind nur dann möglich, wenn mindestens eine davon eine Beteiligung an einem internationalen Programm ist, das den FWF-Schwerpunkt-Programmen entspricht und im LAV abgewickelt wird (Lead Agency im Ausland).

Welche Mittel können beantragt werden?

Beantragbar sind nur „projektspezifische Kosten“, das sind Personal- und Sachmittel (siehe auch Anhang I S. 7), die zur Durchführung des Projekts benötigt werden und über die von der „Infrastruktur“ der Forschungsstätte bereitgestellten Ressourcen hinausgehen. Gerätekosten können nicht beantragt werden. Der FWF finanziert keine „Infrastruktur“ oder „Grundausstattung“ einer Forschungsstätte.

Es gilt das Verbot der Doppelförderung; das heißt, dass ein beantragtes Projekt nicht oder nicht in vollem Umfang von einer anderen Stelle oder im Rahmen eines anderen Programms des FWF finanziert werden darf. Ein in substantiellen Teilen identischer Antrag darf nicht mehrfach - weder in der gleichen noch in einer anderen Programmkategorie - eingereicht werden, außer die programmspezifischen Antragsrichtlinien sehen eine diesbezügliche Ausnahmeregelung vor.

Wie ist zu beantragen?

Einreichtermin für die Konzeptanträge ist der **30. September** jeden Jahres (Datum des Poststempels; wenn Samstag oder Sonntag oder Feiertag, dann nächst folgender Werktag).

Alle Teile der Konzeptbeschreibung, die Abstracts und die Beilagen (Stellungnahmen zu Gutachten bei Neuplanungen) sind **ausschließlich in Schriftgröße 11pt** zu verfassen.

In **schriftlicher Form** ist **1-fach** vorzulegen mit den **Originalunterschriften und Originalstempeln**:

- 1 jeweils einseitige Projektkurzfassung des gesamten DK** in Deutsch und in Englisch mit **max. 450 Worten** (inkl. Abbildungen und Tabellen und Fußzeilen) inkl. Liste der Faculty Members und KooperationspartnerInnen (siehe Vorlagendatei)
- 2 Ausgefüllte Antragsformulare (bestehend aus Antragsformular und programmspezifischen Daten)**
- 3 Unterstützungserklärung** der tragenden Forschungsstätte mit Promotionsrecht
- 4 Beiblatt mit Nennung (Name, Kontaktdaten) aller Personen als MitautorInnen:** bei einem DK gelten alle Faculty Member als MitautorInnen und müssen deshalb hier angeführt werden

In **schriftlicher Form** ist in **10-facher Kopie** vorzulegen:

5 Formloser Antrag bestehend aus:

- **Deckblatt: Name und Institutsadresse der SprecherIn und CosprecherIn**
- **Inhaltsverzeichnis**
- **Projektbeschreibung:**

Formale Vorgaben: DIN A4, Zeilenabstand 1,5; Schriftgröße 11pt, einseitig bedruckt, mit fortlaufenden Seitenzahlen versehen und gebunden oder spiralisiert, in 10 facher Kopie

- **Beschreibung des DK Forschungs- und Ausbildungsprogrammes** im Gesamten auf **max. 25 Seiten mit max. 11250 Worten** (inkl. Überschriften, Fußnoten, Tabellen, Abbildungen, Abbildungslegenden etc.)
- **Verzeichnis der projektrelevanten Literatur⁶⁴ und Abkürzungsverzeichnis** auf **max 5** Seiten
- **Beschreibung der DK Faculty:**
Formale Vorgaben: DIN A 4; Schriftgröße 11pt, einseitig bedruckt. Pro Faculty Member müssen die Punkte 1-13 (Inhalte siehe Dateivorlage auf der FWF Homepage) dargestellt werden; die unter Punkt 5 geforderten zwei Showcase Projekte sind beispielhafte Dissertationsprojekte, die im Rahmen des zukünftigen DK durchgeführt werden sollen. Es dürfen keine laufenden Dissertationsprojekte beschrieben werden. Jedes Dissertationsprojekt muss eine klare Fragestellung, sowie einen ungefähren Arbeitsplan mit entsprechender Methodenauswahl beinhalten.

6 Andere Beilagen (siehe Anhang I „Erläuterungen und Definitionen Förderungskategorie DK“) sind einfach vorzulegen.

Auf **Datenträger** (keine geschützten Dateien!) ist einzureichen:

- **einseitige Kurzfassung des gesamten DK** jeweils in einer eigenen Datei in Deutsch und in Englisch (inkl. Liste der Faculty Member und der potenziellen internationale KooperationspartnerInnen Dateiformat: Word für Windows; Schriftgröße 11pt, keine Sonderzeichen!)
- **Antragsformulare und Programmspezifische Daten** (Dateiformat: PDF; keine eingescannten Dateien verwenden!)
- **Formloser Antrag** (=Projektbeschreibung, Literatur-/Abkürzungsverzeichnis und Beschreibung der DK Faculty) (Dateiformat: PDF)
- **Beiblatt mit Nennung aller AutorInnen und ausgefüllte Antragsformulare** (Dateiformat: PDF; keine eingescannten Dateien verwenden!)
- **Unterstützungserklärung der Universität** (das Originalschreiben eingescannt)
- **Beilagen** (siehe Anhang I „Erläuterungen und Definitionen Förderungskategorie DK“) jeweils in einzelnen Dateien (Dateiformat: PDF)

Wichtig: Nach Einlangen des Antrags sind keine Änderungen am Antrag mehr möglich. **Unvollständige Anträge, wie auch solche, die den Bestimmungen des FWF widersprechen oder sonst formal nicht genügen (insbesondere auch Überschreitungen des Umfangs des Antrags, kleinere Schriftgröße)**

⁶⁴ Das Verzeichnis der projektrelevanten Literatur muss für jede Publikation enthalten: alle AutorInnen, vollständige Titel, Publikationsorgan, Jahr, Seitenangaben (siehe auch Anhang I Pkt.8).

werden vom FWF - ohne Einleitung eines internationalen Begutachtungsverfahrens – abgesetzt (siehe auch Punkt 7 des Anhanges I).

Mit der Übermittlung einer elektronischen Version des Antrags auf einem Datenträger wird das Begutachtungsverfahren erleichtert und beschleunigt. In der elektronischen Version sind keine Unterschriften notwendig. Die Dateien sind wie unten angeführt zu benennen und ihre Größe ist so klein wie möglich zu halten. Die Summe aller auf Datenträger eingereichten Dateien darf die Größe von 5 MB nicht überschreiten.

Vorgaben zu den Dateibenennungen

1. Vorlage-Dateien (teilweise auf der FWF Homepage zu finden) – jedenfalls unter der angegebenen Bezeichnung auf dem Datenträger zu speichern

- **Abstr_C_Name der SprecherIn_eng.doc** und **Abstr_C_Name der SprecherIn_deu.doc** (=jeweils in einer eigenen Datei Projektkurzfassungen in Deutsch u. Englisch (inkl. Liste der Projektteil-LeiterInnen und internationale KooperationspartnerInnen)
- **1_Proposal_C_Name SprecherIn.pdf** (bestehend aus: 1.) formloser Antrag inkl. Literatur-/Abkürzungsverzeichnis und 2.) Beschreibung der DK Faculty)
- **2_Antragsformular**
- **3_Programmspezifische Daten**
- **4_Unterstützungserklärung der tragenden Forschungsstätte mit Promotionsrecht**
- **5_Beiblatt mit Nennung (Name, Kontaktdaten) aller Personen als MitautorInnen**

2. Beilagen (nur falls erforderlich; siehe Anhang I/6.)

- **Annex_Revision.pdf/doc** (=Stellungnahmen zu Gutachten bei Neuplanungen; zu **jedem** Gutachtenauszug in jeweils einer **eigenen** Datei; Annex_Revision_A.pdf/doc, Annex_Revision_B.pdf/doc etc.)
- **Annex_Reviewers.doc** (=Negativliste GutachterInnen)
- **Annex_Änderungen** (=bei Neuplanung, **Übersicht, über alle im Antrag vorgenommenen Änderungen**)

Die Begutachtung der Anträge erfolgt durch internationale FachgutachterInnen, denen vom FWF Anonymität zugesichert wird.

Um eine internationale Begutachtung zu gewährleisten, sind die Anträge in englischer Sprache einzureichen – fakultativ kann eine Version in Deutsch oder in einer anderen einschlägigen Fachsprache zusätzlich beigefügt werden. Eine Antragstellung ausschließlich in Deutsch oder in einer anderen einschlägigen Fachsprache außer Englisch kann nur in Ausnahmefällen erfolgen. Diese Ausnahmen betreffen ausschließlich Anträge aus den Sprach- und Literaturwissenschaften, wenn sie nur deutschsprachige bzw. anderssprachige (außer englischsprachige) Texte bearbeiten und keine Kontextualisierung in einen internationalen Rahmen zum Ziel haben. In jedem dieser Fälle ist ausnahmslos vor Einreichung des Antrags Rücksprache mit den jeweils zuständigen ProjektbetreuerInnen zu halten und dann ggf. ein Abstract des Antrags (max. 1 A4 Seite) mit einer kurzen wissenschaftlichen Begründung (in elektronischer Form) vorzulegen. Über die Ausnahmen entscheidet das Präsidium des FWF.

Die Projektbeschreibung als Teil des formlosen Antrags muss auf folgende Punkte eingehen:

Ein DK bildet ein international sichtbares und konkurrenzfähiges Zentrum für eine strukturierte, an international hochqualitative Forschung mit gemeinsamer thematischer Ausrichtung angebundene Ausbildung von besten NachwuchswissenschaftlerInnen.

Die nachfolgenden Punkte (1.1. – 1.6.) müssen Bestandteil des DK Programms sein und sind im Rahmen des Konzeptantrags daher zu adressieren. Vertiefenden Ausführungen zu den einzelnen Punkten werden in der 2. Stufe des Verfahrens im Rahmen des Vollantrages gefordert.

1.1. Forschungsprogramm

- Beschreibung eines mittelfristig angelegten und klar definierten (möglichst auch disziplinenübergreifenden⁶⁵) Forschungszusammenhanges (Forschungsschwerpunkt, Forschungsbereich, Kompetenzfeld): Die Breite des thematischen Rahmens ist flexibel. Es muss jedoch sicher gestellt sein, dass ein intensiver Kontakt- und Gedankenaustausch von DoktorandInnen und Faculty Mitgliedern zwischen den Themenbereichen möglich ist und eine Ausbildung im DK ein sinnvolles Curriculum ergibt. Das Zusammenwirken der wissenschaftlichen Teilbereiche ist darzustellen. Aktuelle und künftige Fragestellungen im Sinne der langfristigen Perspektive des DK sind darzustellen.
- Beschreibung des Standes der Forschung auf dem das Forschungsprogramm aufbaut: Die im Rahmen des DK Forschungsthemen in den Dissertationen geplanten Forschungsarbeiten müssen hohen internationalen Standards genügen (zumindest auf dem Niveau von FWF-Projekt- und Schwerpunktförderungen) und sie müssen im Rahmen von Dissertationen durchführbar sein. Diese sind, entsprechend den internationalen Standards für eine PhD-Ausbildung, jeweils auf eine Dauer von 3 Jahren anzulegen. Eine Liste an möglichen Dissertationsthemen ist beizufügen. Die inhaltliche Ausformulierung dieser Dissertationsprojekte erfolgt im Rahmen der Beschreibung der DK Faculty (Pkt. 5 - 2 Showcases pro Faculty Member). Kooperationen mit WissenschaftlerInnen außerhalb des DK, national und international, sind tabellarisch darzustellen (Angabe von Namen, Institution, sowie email oder web Adresse).

1.2. Ausbildungsprogramm

- Alle Komponenten des Ausbildungsprogramms gelten sowohl für interne DoktorandInnen aus dem „Grundstock“ wie für „assoziierte“ DoktorandInnen (siehe auch Pkt. 1.4.), die aus anderen Drittmitteln finanziert werden. Die Beschreibung des Ausbildungsprogrammes, das entsprechend den internationalen Standards für ein PhD-Studium und den Grundsätzen der *European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers* organisiert ist und Aspekte der fachübergreifenden Ausbildung sind ebenso mit einzubeziehen wie Training von Teamfähigkeit und der Erwerb von Zusatzausbildungen im Hinblick auf eine Verbesserung der Karrierechancen:
 - *Ausbildungslehrgänge*, die über die rein wissenschaftliche Ausbildung hinausreichen
 - Einbindung in die universitäre Lehre
 - Auseinandersetzung mit wissenschaftlicher Ethik
 - Präsentationstechnik, Projektmanagement, Führungskräfte-Qualifikationen
 - internationale Vernetzung
 - Weiterentwicklung von fachspezifischen Fremdsprachenkenntnissen etc.
- Es ist ein Betreuungskonzept zu entwickeln und zu beschreiben, das verbindliche Vereinbarungen zwischen der Universität, den BetreuerInnen und den DoktorandInnen trifft und insbesondere Ansprüche hinsichtlich Betreuungsintensität und Interaktionen klar festlegt. In diesem Konzept muss eine systematische Integration der DoktorandInnen in nationale und internationale wissenschaftliche Netzwerke sowie die Teilnahme an internationalen Tagungen vorgesehen sein.
- Die Bedingungen für den Abschluss der Dissertation sind eindeutig zu formulieren.
- Es ist das Qualifikationsprofil der Studierenden nach dem Abschluss des DK zu beschreiben.
- Eine Regelung im Hinblick auf Intellectual Property Rights (IPR), Ko-AutorInnenschaften, Publikationen usw. ist festzuhalten.
- Für die Beurteilung der Dissertation und das Rigorosum ist ein ausländischer Wissenschaftler/eine ausländische Wissenschaftlerin mit beizuziehen, die/der nicht an der Betreuung mitgewirkt hat.
- Es wird erwartet, dass jede/r DoktorandIn einen Auslandsaufenthalt von mindestens 6 Monaten an einer renommierten ausländischen (universitären oder außeruniversitären) Forschungseinrichtung verbringt. Diese Aufenthalte sind so zu planen und in die Konzeption der

⁶⁵ Damit ist gemeint: inter-, multi- oder transdisziplinär (Definition der DFG: "interdisziplinär": zwischen 2 Disziplinen; "multidisziplinär": zwischen mehreren Disziplinen; "transdisziplinär": den wissenschaftlichen mit dem außerwissenschaftlichen Bereich verbindend).

Ausbildung und der Dissertationen zu integrieren, dass ein qualitativer Mehrwert für beide entsteht.

Es muss sichergestellt sein, dass alle DoktorandInnen im DK, insbesondere jene aus anderen Ländern, als DoktoratstudentInnen an den jeweils beteiligten Universitäten aufgenommen werden können, ihre Ausbildung den Vorschriften des PhD-Studiums an den jeweils beteiligten Universitäten entspricht und einen entsprechenden Abschluss ermöglicht. Ein 30% Anteil an Studierenden aus anderen Ländern ist anzustreben.

1.3. Die Faculty

WissenschaftlerInnen mit hochkarätiger, internationaler wissenschaftlicher Forschungsleistung und Ausbildungserfahrung schließen sich als Faculty zusammen, um in organisierter Form DoktorandInnen auszubilden.

- Die Größe der ein DK tragenden Faculty ist abhängig vom wissenschaftlichen Potenzial an einem Forschungsstandort. Die Größe der Faculty kann beim Erstantrag 5 bis maximal 20 WissenschaftlerInnen betragen. Nach Regeln, die das DK selbst definiert und die Gegenstand der Begutachtung sind, kann die Faculty im Zuge der periodischen Zwischenevaluationen erweitert werden, wobei die Zunahme maximal 50 % der jeweils bestehenden Größe betragen kann. Der Mehrwert solcher Erweiterungen wird im Zuge der Zwischenevaluation überprüft.
- Dem FWF ist es ein Anliegen den Frauenanteil auch im Rahmen der Doktoratsprogramme zukünftig stark zu erhöhen. Falls weniger als 30% Frauen im vorliegenden Antrag teilnehmen, muss eine Begründung im Rahmen der Beschreibung der beteiligten WissenschaftlerInnen erfolgen. Im Rahmen der Zwischenbegutachtung wird die Entwicklung der Faculty auch im Bezug auf die Frauenbeteiligung überprüft werden.

Der Auswahlprozess (Qualifikation und Aufnahmebedingungen) für die Faculty ist eingehend zu beschreiben.

1.4. DoktorandInnen

DoktorandInnen in einem DK müssen die vom DK definierten Voraussetzungen für eine anspruchsvolle wissenschaftliche Ausbildung und Laufbahn erfüllen.

- Das DK definiert dazu ein Aufnahmeverfahren, das eine strenge qualitative Auswahl der DoktorandInnen vorsieht, um einen hohen wissenschaftlichen Standard eines Kollegs zu sichern. Pro Faculty Mitglied wird im DK ein/e DoktorandIn finanziert („interne“ DoktorandInnen). Für jedes Faculty Mitglied können bis zu zwei weitere DoktorandInnen („assozierte“ DoktorandInnen) aufgenommen werden, die dem gleichen Aufnahmeverfahren wie die „internen“ DoktorandInnen unterzogen werden müssen. Die „assozierten“ DoktorandInnen erhalten ihre Grundfinanzierung (Gehalt, Sachmittel) aus anderen Drittmitteln. Für sie werden im Rahmen des DK nur die DK- spezifischen Ausbildungskosten getragen, ansonsten sind sie voll in das DK integriert.
- Der internationale Auswahlprozess (Qualifikation und Aufnahmebedingungen) der internen und assoziierten Studierenden ist eingehend zu beschreiben. Ein 30% Anteil an Studierenden aus anderen Ländern ist anzustreben.
- Unter den DoktorandInnen soll ein Frauenanteil angestrebt werden, der zumindest dem Anteil der AbsolventInnen auf dem Diplom- (Master-) Niveau entspricht.

1.5. Internationalität und Auswahlverfahren

Internationalität ist ein wesentliches Merkmal eines DK und stärkt nachhaltig die Wissenschaft am jeweiligen Standort und in Österreich allgemein.

Ein wesentliches Qualitätskriterium für ein DK ist daher ein ausgewogenes Verhältnis zwischen österreichischen DoktorandInnen und DoktorandInnen, die ihre Graduiertenausbildung und ihren Abschluss in einem anderen Land als Österreich absolviert haben. Ein 30% Anteil an internationalen Studierenden ist anzustreben.

1.6. Gendergerechte Ausrichtung

- Genderrelevante Aspekte sind besonders zu berücksichtigen, sowohl bei der Ausrichtung der Forschungs- (Dissertations-) themen wie auch bei der Gestaltung der Arbeitsbedingungen und des Arbeitsumfeldes.
- Unter den DoktorandInnen soll ein Frauenanteil angestrebt werden, der zumindest dem Anteil der AbsolventInnen auf dem Diplom- (Master-) Niveau entspricht. Analog sollte der Anteil an WissenschaftlerInnen in der Faculty zumindest dem Frauenanteil im jeweiligen Fach entsprechen. Die Umsetzung dieses Anspruchs ist ein wesentliches Qualitätskriterium für ein DK (Erläuterungen zur Überprüfung der Gender-Relevanz siehe <http://www.fwf.ac.at/de/gender/index.asp>).

ANHANG I: Erläuterungen und Definitionen „Förderungskategorie DK“

1 Zulassungsvoraussetzungen

1.1 Projekt der nicht auf Gewinn gerichteten wissenschaftlichen Forschung

Gemeinhin oft auch als „Grundlagenforschung“ bezeichnet; darunter ist jene Forschung zu verstehen, deren Wert sich in erster Linie aus ihrer Bedeutung für die Weiterentwicklung der Wissenschaft definiert (erkenntnisorientierte wissenschaftliche Arbeit).

1.2 Doppelförderung ist verboten

Zuwendungen, die im Umfeld des vorliegenden Themas beim FWF oder anderen Förderungsträgern beantragt sind bzw. von anderen Förderungsträgern erhalten werden (z.B. EU, OeNB, Ministerien, etc.) sind anzugeben (siehe Antragsformulare).

2 Beantragbare, projektspezifische Kosten

Im Rahmen des **Konzeptantrags ist nur eine grobe Kostenkalkulation durchzuführen**. D.h. es muss **eine allgemeine Darstellung von Personal- und Sachmittel erfolgen, diese muss jedoch noch nicht pro Faculty Member kalkuliert und dargestellt werden, sondern kann gesammelt als Bedarf pro Jahr dargestellt werden**. Im Vollantrag (2. Stufe des Verfahrens) ist dann eine genaue Aufschlüsselung pro Kostenkategorie notwendig. Grundsätzlich können folgende beschriebene Kostenkategorien im Rahmen des DK Programms beantragt werden.

- **Personalkosten**

Das DK kann in der ersten Förderperiode (Dauer 4 Jahre) eine Vollzeit KoordinatorInnenstelle (Post doc Satz) für 4 Jahre beantragen. Der/die KoordinatorIn sollte idealerweise Erfahrungen im Wissenschaftsmanagement vorweisen, um das DK und die Studierenden in allen notwendigen DK und uniinter- nen administrativen Notwendigkeiten unterstützen zu können (Inskription, Visa, Aufenthalt, Rekrutierung der Studierenden, Auslandsaufenthalte etc.).

- Pro Faculty Member kann 1 DissertantInnen-Stelle (PhD-Stelle) beantragt werden. Die Beschäftigungsdauer für den/die einzelne Studierende beträgt 36 Monate.
- Im Rahmen der ersten Förderperiode des DK (Dauer 4 Jahre) ist eine *maximale Beantragung der PhD Personalkosten für 3,5 Jahre möglich*, da erfahrungsgemäß ein halbes Jahr benötigt wird, bis die ersten Studierenden, die den Auswahlprozess absolviert haben, ins DK aufgenommen werden. Im Rahmen aller weiteren Perioden (jeweils 4 Jahre) können die Personalkosten für PhD-Studierende für 4 Jahre beantragt werden, da das DK dann einen steady state (Eintritt und Austritt der PhDs) erreicht hat. Die bewilligten Personalkosten (PhD-Stellen) sind zweckgewidmet, d.h. diese Mittel sind nicht Teil des Globalbudgets, können daher auch nicht umgewidmet und für andere Kostenkategorien verwendet werden.

- Verbleib des /der Studierenden im DK für ein 4. Jahr: Hat der/die Studierende im Rahmen der ersten 3 Jahre der Anstellung im DK von den 6 Monaten Auslandsaufenthalt mind. 3 Monate absolviert, ist das DK berechtigt, diese Person für ein 4. Jahr weiter anzustellen, sofern die Mittel im DK Budget vorhanden sind. Werden im Rahmen dieses 4. Jahres weitere 3 Monate im Ausland verbracht, so kann der/die SprecherIn des DK die Personal- und Materialkosten für dieses 4. Jahr im Rahmen der nächsten Zwischenbegutachtung beim FWF beantragen. Es können max. so viele 4. Jahre beantragt werden, wie ursprünglich PhD-Stellen bewilligt wurden. Der/die SprecherIn ist verpflichtet, den Auslandsaufenthalt (Datum des Aufenthaltes) im Rahmen der Zwischenbegutachtung darzustellen und zu bestätigen. Ausbildungskosten für dieses 4. Jahr können nicht beim FWF beantragt werden.

Das aktuelle Gehaltsschema des FWF („Personalkostensätze bzw. Gehälter“ bzw. für AbsolventInnen eines Medizinstudiums in Österreich „Personalkostensätze bzw. Gehälter - MedizinerInnen“) enthält die derzeit gültigen beantragbaren Kostensätze. Bei laufenden Dienstverträgen rechnet der FWF zum Zeitpunkt der tatsächlichen Erhöhung den Personalkosten eine jährliche Inflationsabgeltung hinzu.

Die Begründung zum beantragten Personal muss enthalten:

- Arbeitsbeschreibung der vorgesehenen Personalstelle;
- Ausmaß der Beschäftigung: Für DoktorandInnen beträgt das maximale beantragbare Beschäftigungsausmaß 75% (dies entspricht 30 Wochenstunden). Die Dienstverträge im DK für DoktorandInnen sind nicht teilbar, d.h. es kann eine bewilligte PhD Stelle nicht auf mehrere Personen aufgeteilt werden, die zu einem geringeren Beschäftigungsausmaß als 75% angestellt werden.

Zuständig für Rechtsfragen:

Dr. Ingrid JANDL (Telefon: 01/ 5056740, DW 30, e-mail: jandl@fwf.ac.at)

Mag. Ulrike VARGA (Telefon: 01/ 5056740, DW 40, e-mail: varga@fwf.ac.at), insbesondere zur Problematik der Niederlassungsbewilligung für ausländische ProjektmitarbeiterInnen aus Nicht-EWR-Staaten.

- **Materialkosten**

Unter Material fallen Verbrauchsmaterialien und Kleingeräte (einzeln bis EUR 1.500,00 inkl. MwSt).

Die Berechnung der beantragten projektspezifischen Materialkosten ist anhand der Zeit-, Arbeits- und Versuchspläne zu begründen. Im Rahmen des DK Antrags können maximal EUR 10.000,- pro Jahr und pro vom DK finanzierter PhD-StudentIn (interne DoktorandIn) beantragt werden. Für die erste Förderperiode können analog zu den Personalkosten für die PhD-StudentInnen nur Materialkosten für 3,5 Jahre, d.h. max. EUR 35.000 (EUR 10.000 x 3,5), beantragt werden. Für Studierende, die aufgrund der Absolvierung von 6 Monaten Auslandsaufenthalt für ein 4. Jahr im DK finanziert werden, können Materialkosten für dieses 4. Jahr beantragt werden.

- **Sonstige Kosten**

- Ausbildungskosten:
 - Pro Faculty Member können im DK Ausbildungskosten für 1 internen/-e DoktorandIn geltend gemacht werden.
 - Pro Faculty Member können im DK Ausbildungskosten für max. 2 assoziierte DoktorandInnen geltend gemacht werden. Assoziierte DoktorandInnen sind jene Studierende, deren Personalkosten aus anderen Drittmitteln finanziert werden, die aber durch das Auswahlverfahren des DK rekrutiert werden und auch vollständig ins DK integriert sind. Die Anzahl der assoziierten DoktorandInnen sowie eine nachvollziehbare Finanzierung eben dieser ist im Antrag darzustellen, d.h. die Finanzierungsvarianten dieser Stellen sind im Antrag zu erläutern, um die Ausbildungskosten beantragen zu können. Schätzungen werden in diesem Zusammenhang vom FWF nicht akzeptiert. Eine sinnvolle Kohortenbildung im Rahmen der Förderperiode ist anzustreben. Im Rahmen der Zwischenbegutachtung werden alle assoziierten DoktorandInnen nach den gleichen Kriterien wie die internen DoktorandInnen evaluiert inkl. der Rahmenbedingung ihrer Arbeit (Gehalt, verfügbare Sachmittel, Infrastruktur; vorhandene Restmittel aus den Ausbildungskosten für assoziierte StudentInnen können eingezogen werden).

- Pro DoktorandIn (interne und assoziierte) können maximal EUR 5.000 an sonstigen Kosten (=Ausbildungskosten) pro Jahr pauschal beantragt werden und müssen nicht begründet werden. Diese Kosten sollen Aufwendungen für Retreats, thesis committee, projektspezifische Ausbildung, Auslandsaufenthalt von 6 Monaten, Kurse im Bereich „generic skills“ (z.B. Projektmanagement, scientific writing, scientific english), Einladung zum Interview sowie Reisekosten zu Konferenzen abdecken. Weiters können diese Mittel auch für die Einladung von GastwissenschaftlerInnen und die Einladung von Seminar SprecherInnen verwendet werden. Über den Maximalbetrag von EUR 5.000 pro Jahr können pro DoktorandIn somit keine weiteren sonstigen Kosten beantragt werden.

In der ersten Förderperiode können analog zu Personalkosten max. EUR 17.500 (EUR 5.000 x 3,5) pro interner und externer DoktorandIn beantragt werden, um die o.a. Kostenkategorien zu finanzieren. Im Rahmen aller weiteren Perioden (jeweils 4 Jahre) beträgt der Maximalbetrag pro interner und externer DoktorandIn EUR 20.000.

Für DoktorandInnen, die ein 4. Jahr im DK finanziert werden, können keine Ausbildungskosten beantragt werden.

- **Allgemeine Projektkosten**

Dazu zählen Kosten für zusätzliche Kongressreisen, Disseminationsaktivitäten (Webseite) u. dgl. sowie Kosten für unvorhergesehene projektspezifisch notwendige kleinere Ausgaben wie Reparaturen, Mithilfe von StudentInnen, etc.

Allgemeine Projektkosten sind im Antragsformular im dafür vorgesehenen Feld im obligatorischen Ausmaß von 5% der übrigen beantragten Förderungsmittel anzuführen. In der Projektbeschreibung ist für allgemeine Projektkosten keine Begründung notwendig.

3 Nicht beantragbare Kosten

3.1. Infrastruktur

Darunter sind alle Einrichtungen zu verstehen, die zur Aufrechterhaltung des normalen Betriebes der Forschungsstätte notwendig sind (wie Baulichkeiten, Installationen, Kommunikationseinrichtungen u. dgl.). Notwendige Infrastruktur soll im Rahmen des Vorvertrages zwischen SprecherIn und Universität verhandelt werden.

3.2. Umfangreiche Werkverträge für Personen, die bereits sechs Jahre in FWF Projekten beschäftigt waren

Nicht zulässig ist die Vereinbarung eines Werkvertrags in größerem Umfang (mehr als EUR 4.500,00) mit Personen, die bereits sechs Jahre im Rahmen eines Dienstvertrags in FWF-Projekten beschäftigt und vom FWF finanziert waren.

3.3. Gerätekosten

Geräte werden im Rahmen des DK nicht finanziert. Sämtliche Geräte und analoge Ausrüstungen müssen als Teil der Grundausstattung von der Forschungsstätte bereitgestellt werden.

3.4. Disseminationsaktivitäten

Kosten für Publikationen können bei FWF-Projekten nicht beantragt werden. Allerdings fördert der FWF bei bewilligten Projekten referierte Publikationen auf Antrag bis 3 Jahre nach Projektende mit zusätzlichen Mitteln; siehe dazu http://www.fwf.ac.at/de/projects/referierte_publicationen.htm

4 Antragsformular und Programmspezifische Daten

Die Formulare (Antragsformular und Programmspezifische Daten) müssen vollständig ausgefüllt werden. Damit der Antrag rechtsverbindlich ist, benötigt der FWF ein Exemplar der „Erklärung der Antragstellerin bzw. des Antragstellers“ und der „Einverständniserklärung der Forschungsstätte mit Promotionsrecht der Antragstellerin/des Antragstellers“ mit Originalunterschriften und wo gefordert mit Originalstempel.

5 Beiblatt mit Nennung aller AutorInnen

Sämtliche Personen, die substantielle wissenschaftliche Beiträge bei der Entstehung und Verfassung des Antrages geleistet haben, sind als MitautorInnen inkl. einer kurzen Beschreibung der Art des Beitrages anzuführen. Im Falle des DK Antrags sind alle Faculty Member als MitautorInnen anzuführen.

6 Beilagen

Der Projektbeschreibung und dem Antragsformular sind, soweit erforderlich, folgende Beilagen anzufügen:

6.1. Überarbeitung eines abgelehnten Konzeptantrages

- Handelt es sich beim vorgelegten Projekt um eine Überarbeitung eines abgelehnten Antrags, ist darauf am Anfang der formlosen Projektbeschreibung (z.B. Fußnote) hinzuweisen.
- Weiters ist eine kurze Stellungnahme zu jedem Gutachten jeweils in **einem eigenen Dokument** beizulegen, die auf Anregungen und Kritikpunkte des jeweiligen Gutachtens eingeht sowie die darauf basierenden Änderungen darstellt. Eine solche Stellungnahme ist nicht notwendig zu Gutachten, deren VerfasserInnen von der Begutachtung des neu eingereichten Antrags ausgeschlossen werden sollen. Der Ausschluss muss allerdings begründet werden und wird bereits für die „Negativliste“ bei der Neueinreichung mitgezählt.
- In einem Begleitschreiben an den FWF muss jedenfalls eine Übersicht über alle im neu eingereichten Antrag vorgenommenen Änderungen beigelegt werden.
- Empfehlung: Da bei der Begutachtung eines überarbeiteten Antrags i.d.R. immer auch neue GutachterInnen eingeschaltet werden, kann es sinnvoll sein, in der Projektbeschreibung auf wichtige Modifikationen, die auf ausdrückliche Anregungen der GutachterInnen hin erfolgten, in geeigneter Form (in Klammern oder als Fußnoten) kurz hinzuweisen.

Werden keine substantiellen Änderungen im neu eingereichten Antrag vorgenommen, kann der Antrag vom Präsidium abgesetzt werden.

Es wird darauf hingewiesen, dass darüber hinausgehende Beilagen keine Berücksichtigung finden und die AntragstellerInnen mit der Unterschrift auf den Antragsformulare zusichern, dass die schriftlichen und elektronischen Versionen des Antrags identisch sind.

7 Bearbeitung des Konzeptantrags

Alle Anträge, die bis zum 30.9. (Nachweis durch Datum des Poststempels; wenn Samstag oder Sonntag oder Feiertag, dann nächster Werktag) eintreffen, werden im FWF formal geprüft.

Inhaltliche Nachbesserungen und Änderungen im formlosen Antrag sind nicht möglich.

Formale Nachreichungen (z. B. Originalunterschriften oder -stempel) sind nur nach rechtzeitiger Rücksprache mit dem Büro des FWF (d.h. vor Einreichung des Antrags) bis max. 10 Tage nach Ende der Einreichfrist möglich.

Unvollständige Anträge oder Förderungsanträge, die den Bestimmungen des FWF widersprechen oder sonst formal nicht genügen (insbesondere auch Überschreitungen des Umfangs des Antrags, kleinere Schriftgröße), werden ohne ein internationales Begutachtungsverfahren einzuleiten vom FWF abgesetzt.

Bereits einmal vom FWF abgelehnte Anträge, die erneut eingereicht werden, aber keine wesentlichen Überarbeitungen aufweisen, werden idR ohne Einleitung eines internationalen Begutachtungsverfahrens vom FWF abgesetzt.

Das **Verfahren zur Einrichtung eines DK** sieht vor der Formulierung eines ausführlichen Vollertrages eine **schriftliche Vorbegutachtung eines Konzeptes** durch unabhängige ExpertInnen vor (Fragen an die FachgutachterInnen siehe Anhang II). **Ergebnis der Vorbegutachtung** soll vor allem den InitiatorInnen die Einschätzung erleichtern,

- ob sich die Problemstellung für ein DK eignet;
- ob das Konzept des Forschungs- und Ausbildungsprogramms inhaltlich modifiziert werden muss;
- ob der Kreis aller beteiligten WissenschaftlerInnen (mind. 5 - 20 WissenschaftlerInnen, inklusive SprecherIn) ausgeweitet oder eingeschränkt werden sollte;
- ob vorerst eine andere Förderungsform für die geplanten Forschungen in Erwägung gezogen werden sollte (beispielsweise die Bearbeitung der Thematik im Rahmen von Einzelprojekten).

Das Ergebnis der Vorbegutachtung ist keine Präjudizierung des Ergebnisses der Begutachtung des definitiven Vollertrages; d.h. aus dem Ergebnis der Vorbegutachtung kann keinerlei Anspruch auf eine mögliche Förderung des Projektes in der nächsten Stufe der Hauptbegutachtung abgeleitet werden!

Das **Begutachtungsverfahren** dauert in der Regel ca. 5-7 Monate. Nach Abschluss des Begutachtungsverfahrens entscheidet das Kuratorium auf Basis der Fachgutachten über die Freigabe des Konzeptantrags und die Einladung zum Vollertrag. Von den Entscheidungen der Organe des FWF werden die AntragstellerInnen jeweils schriftlich in Kenntnis gesetzt. Die Zahl der für eine positive Entscheidung erforderlichen Fachgutachten ist mindestens 4.

7.1. GutachterInnenvorschläge

Dem Antrag kann zu den Beilagen (in Papier- und elektronischer Form - Format: Word) eine Liste für GutachterInnen, die aufgrund von möglichen Befangenheiten nicht mit der Begutachtung des Antrages befasst werden sollen („Negativliste“), hinzugefügt werden:

Negativliste: Die AntragstellerInnen können **max. 3** potentielle GutachterInnen, von denen sie der Ansicht sind, dass Befangenheiten vorliegen könnten, vom Begutachtungsprozess ausschließen. Wenn die Angaben in einer fachlichen Prüfung verifiziert werden konnten, wird das Präsidium des FWF dem i.d.R. folgen. Die Negativliste muss kurz begründet werden.

GutachterInnen gelten als befangen wenn,

- sie beruflich, finanziell oder persönlich von der Bewilligung oder Ablehnung des Antrages profitieren könnten;
- AntragstellerInnen (auch MitarbeiterInnen und/oder KooperationspartnerInnen) mit den GutachterInnen in den letzten fünf Jahren gemeinsam publiziert, kooperiert oder an der gleichen Forschungsstätte gearbeitet haben;
- es zwischen AntragstellerInnen (auch MitarbeiterInnen und/oder KooperationspartnerInnen) und GutachterInnen grundsätzliche wissenschaftliche Meinungsverschiedenheiten gibt (bspw. Schulen- und/oder Methodenstreits);
- darüber hinaus berufliche oder persönliche Nahverhältnisse bestehen, die gegenüber Dritten den Anschein der Befangenheit erwecken könnten.

Es wird darauf hingewiesen, dass eine Liste von möglichen GutachterInnen, die dem Präsidium des FWF von den AntragstellerInnen vorgeschlagen werden (eine sogenannte „Positivliste“), nicht erwünscht ist und grundsätzlich nicht berücksichtigt wird.

8 Allfällige zusätzliche Angaben

Der FWF weist darauf hin, dass die/der AntragstellerIn verpflichtet ist, die für ihr/sein Projekt gültigen Rechts- (z.B. Bundes-Behindertengleichstellungsgesetz) und Sicherheitsvorschriften einzuhalten und alle notwendigen Genehmigungen (z.B. durch Ethikkommission, Tierversuchskommission, Bundesdenkmalamt oder die entsprechenden ausländischen Behörden) einzuholen.

Generell sind die allgemeinen Regeln guter wissenschaftlicher Praxis einzuhalten. Das bedeutet insbesondere, dass

- a) die für die jeweiligen Wissenschaftsdisziplinen gängigen Quellennachweise auch bei der Verfassung des Antrags zu erbringen sind;
- b) Veröffentlichungen so zu verfassen sind, dass alle Ergebnisse stets nachvollziehbar sind;
- c) das Gebot der Offenheit, Anerkennung der wissenschaftlichen Verdienste und Kollegialität unter den Forschenden zu beachten ist.

Bei einem vermuteten Verstoß dagegen erfolgt eine Überprüfung durch die Ombudsstelle der zuständigen Forschungsstätte oder durch die österreichische Agentur für wissenschaftliche Integrität. In dieser Zeit ruht das Begutachtungsverfahren. Das Präsidium des FWF hat beschlossen, die Empfehlungen der DFG-Kommission „Selbstkontrolle in der Wissenschaft“ sinngemäß anzuwenden. Informationen dazu finden Sie auf der Website der Deutschen Forschungsgemeinschaft (DFG) unter <http://www.dfg.de/antragstellung/> (Dokument: „Grundsätze zur Sicherung guter wissenschaftlicher Praxis“).

9 Datenschutz

Der FWF ist berechtigt, alle projektspezifischen Daten EDV-unterstützt zu verarbeiten und im Jahresbericht teilweise zu veröffentlichen bzw. in anonymisierter Form zu statistischen und forschungspolitischen Zwecken weiterzugeben. Die Projektleitung ist verpflichtet, die ProjektmitarbeiterInnen über die EDV-unterstützte Erfassung und Bearbeitung ihrer personenbezogenen Daten zu informieren sowie darüber, dass der FWF diese Daten nicht an Dritte weitergibt, sofern keine gesetzliche Verpflichtung hierzu besteht.

10 Abschließende Hinweise

Der FWF macht darauf aufmerksam, dass die Nichterfüllung von formalen Vorgaben zur Zusammensetzung des Konsortium (siehe „Wer kann beantragen?“) bzw. formale und inhaltliche Vorgaben des Antrages selbst (siehe „Wie ist zu beantragen?“) zur Absetzung führen kann.

Es empfiehlt sich daher, diese Punkte vor Antragseinreichung nochmals zu konsultieren und auch an Hand der zur Verfügung gestellten Checkliste (siehe **ergänzende Hinweise** unter <http://www.fwf.ac.at/de/applications/w-doktoratskollegs.html>), die notwendigen Bestandteile eines DK Antrags zu überprüfen.

ANHANG II : Fragen an FachgutachterInnen der Förderungskategorie „Doktoratskolleg (DK)“⁶⁶

Der FWF strebt in allen Programmen aktiv Chancengleichheit und Gleichbehandlung an. Die Begutachtung eines Antrages darf sich nicht zum Nachteil von AntragstellerInnen auf wissenschaftsfremde Kriterien wie z.B. Lebensalter, Geschlecht etc. stützen. Beispielsweise sollte bei der Begutachtung von Anträgen statt der Betrachtung des absoluten Lebensalters, das Verhältnis von individueller Dauer des wissenschaftlichen Werdegangs und bislang erreichter wissenschaftlicher Leistung im Vordergrund stehen. Chancengleichheit bedeutet für den FWF auch, dass unvermeidbare Verzögerungen im wissenschaftlichen Werdegang antragstellender Personen (beispielsweise längere Qualifikationsphasen, Publikationslücken oder reduzierte Auslandsaufenthalte wegen Kinderbetreuung) angemessen berücksichtigt werden. Bitte denken Sie bei der Formulierung Ihres Gutachtens daran, dass Ihre Stellungnahmen den AntragstellerInnen in anonymisierter Form mitgeteilt werden.

⁶⁶ Weitere Informationen zu „Leitbild und Mission“ des FWF bzw. zu den „Antragsrichtlinien für Doktoratsprogramme“ finden Sie auf unserer Website (www.fwf.ac.at).

Aufgabe des FWF ist es, nach wissenschaftlichen Kriterien den bestmöglichen Einsatz öffentlicher Mittel im Bereich der Grundlagenforschung sicherzustellen. Aufgrund der vom FWF vorgegebenen Anforderungen an einen Projektantrag⁶⁷ sollte es den GutachterInnen möglich sein, zu folgenden Aspekten des Antrages kurz Stellung zu nehmen.

Vollinhaltliche Mitteilung an die AntragstellerInnen:

- **Qualität des DK Forschungsprogramms:**
 - Qualität der Konzeption des DK (fachliche Ausrichtung und Breite, innovative Ansätze, internationale Konkurrenzfähigkeit u.dgl.); Qualität der Forschung, auf der das DK aufbaut (internationale Sichtbarkeit, Aktualität und wissenschaftliches Innovationspotenzial u.dgl.);

- **Qualität des DK Ausbildungsprogramms:**
 - Qualität des Betreuungs- und Ausbildungsprogrammes (Auswahlprozeduren; Betreuungsstrukturen, Bewertungsverfahren der Dissertationen, Teamwork, Zusatzqualifikationen; falls thematisch relevant: gendergerechte Ausrichtung der Dissertationsthemen);

- **Qualität und Zusammensetzung der Faculty:**
 - wissenschaftliche Qualität und Reputation, internationale Vernetzung und Geschlechterverhältnis in der Faculty

- **Organisation und Finanzierung:**
 - Qualität des organisatorischen Konzeptes (Management).
 - Qualität des Konzeptes zur Dissemination und Kommunikation des DK im Sinn der Erhöhung ihrer Sichtbarkeit (incl. Open Access Policy) und ihres Beitrages zur allgemeinen Hebung der „Public Awareness“ von Wissenschaft;
 - Ein-/Anbindung an universitäre wissenschaftliche Schwerpunktsetzungen (Schwerpunktprogramme, Doktorats- und Graduiertenkollegs der Universität(en) etc.).

⁶⁷ Formale Vorgaben siehe Seite 3, Punkt 5.

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Research Report

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