Five educational researchers, coming from a variety of higher education institutions, academic disciplines, and cultural backgrounds, met together over a three-year period to discuss the present and future of doctoral education and training in the field of education. Their hope was that the product of their discussions would enable educators and policy makers around the world to rethink, restructure, and even design new programs to prepare the rising generation of educational researchers in their countries. These differences in academic, national, and institutional perspectives led to a variety of ways, even conflicting ones, in which the quality of doctoral education and training could be improved.

Based on our discussion, we came to the conclusion that there are no universal solutions to the problems involved in setting up and operating a quality doctoral program. Rather, educators would be wise to be aware of the alternatives at their disposal and make informed choices based on an understanding of the larger societal and political contexts in their states, regions, or nations. To facilitate this decision-making process, we have chosen to conclude with a set of key questions that should be addressed by those seeking to examine and improve their doctoral programs in education and briefly describe some of the alternative ways of answering these questions.

Instead of passively absorbing a unified position, then, the reader is invited to join the dialogue that has taken place (and is still taking place) between and among the authors. To exemplify such a dialogue, each chapter is followed by one or two commentaries written by members of the group. We would encourage the reader to write commentaries on the individual chapters (and perhaps the commentaries), thereby engaging in a dialogue with the authors on a fairly personal level.
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ACKNOWLEDGMENTS

This book is published by the Committee on the Nurturing of New Educational Researchers of the International Academy of Education, a not for profit scientific association that promotes educational research, its dissemination and the implementation of its implications. (http://www.iaoed.org/node/1)

The seminars and working meetings that led to the preparation of this book were held in Mexico and were financed by the Programa de Apoyo al Desarrollo de la Educación Superior (PADES), Subsecretaría de Educación Superior, Secretaría de Educación Pública, México.
PREFACE

The genesis for this book was a series of conversations between Denis Phillips (USA) and Maria de Ibarrola (Mexico) that took place in several international venues during 2007 and 2008. Eventually the conversations expanded to include three other Fellows of the International Academy of Education (IAE): Ulrich Teichler (Germany), Gavriel Salomon (Israel), and Lorin Anderson (USA). Although the group was small, the members came from a variety of academic and cultural backgrounds: Denis Phillips is a philosopher who received his doctoral training and initial academic teaching experience in Australia, but who has spent most of his academic career on the faculty at Stanford University. Maria de Ibarrola is a sociologist who received advanced training in Canada, her doctoral training in Mexico, and is currently an educational researcher at the Center for Research and Advanced Studies of the National Polytechnic Institute in Mexico City. Ulrich Teichler is a sociologist who received his doctoral training in Germany, has specialized in higher education for the past four decades, and has extensive academic experience in Japan, the Netherlands, and the United States. Gavriel Salomon is an educational psychologist who received his doctoral training at Stanford University and has spent most of his academic career at the University of Haifa in Israel. Finally, Lorin Anderson is a research methodologist who received his doctoral training at the University of Chicago and spent his entire academic career on faculty at the University of South Carolina.

We came together to develop a project that could assist educators and policymakers around the world who were faced with the need to rethink, restructure, or even establish programs to prepare the rising generation of educational researchers in their countries. We soon realized that – although our areas of disciplinary expertise varied greatly, as did our familiarity with national systems for the preparation of education researchers other than our own – we did have at least one thing in common, namely, experience. Each of us had spent decades educating and supervising aspiring researchers (and in many cases other educational professionals, including evaluators, teacher educators, and curriculum developers, all of whom had at least some tangential relationship to research in education). It even occurred to us, in a nascent form at first, that the differences in perspectives and the accompanying differences in academic and educational values that existed within the group might make us even more collectively helpful than we had originally supposed. From the very first, the members of our group did not envision our task as providing answers or solutions to colleagues who sought us out; rather, we saw our task as offering a reasonable set of alternatives, sometimes conflicting ones. We conceived of our purpose as opening possibilities, not closing them.

We did not have long to wait before putting our ideas to the test. It turned out that Scientific and University authorities in Mexico were beginning a process to
rethink doctoral level education/training to bring it into line with the complexity of national and international requirements. University Deans of Education and senior academics in the field were examining the unparalleled growth in doctoral programs in education, the reasons for this growth, and the ways in which universities were accommodating it. Thanks to the efforts of Maria de Ibarrola funds were made available for us to meet with our Mexican colleagues on three occasions. The first meeting was in Merida in 2010, with about 120 Mexican educators in attendance. At the meeting we made some relatively short presentations to the whole group. However, much of the work took place during small group discussions that were facilitated by Mexican educators with the five of us circulating among the groups and serving as resource persons. Topics included the formative years of scholars (including the role of doctoral programs), the decisions to be made in planning doctoral programs in education, institutional conditions and curricular structures, and the relationship between educational research and educational practice.

Although the meeting was judged to be very successful, many issues remained to be discussed. Consequently, a second meeting was organized, this time in Guadalajara in 2011. Among the new topics and issues introduced were (1) the different occupations that could require a doctoral degree (e.g., researcher, trainer or professional developer, innovator or experimenter, and evaluator), (2) the role of research and other professional knowledge in doctoral programs, (3) alternative pedagogical approaches to prepare doctoral candidates, and (4) how best to evaluate the quality of doctoral programs in education. This second meeting was also seen as a success by our Mexican colleagues.

It was about at this time that we decided to collaborate on a book in which we discussed some of the key decisions that must be made by those reviewing, redesigning, or designing doctoral programs for the preparation of educational researchers. Our choice of decisions was based on our personal experiences as well as the presentations and discussions at the two meetings. We wrote draft chapters during 2012 and exchanged our drafts with one another via e-mail. Realizing that there was only so much that we could accomplish long distance, we met again in Mexico, in Guanajuato, in 2013. The main items on the agenda for this meeting were (1) a discussion of the draft chapters, (2) a dialogue on the overall structure of the book, and (3) an agreement as to how to proceed in the future. One evening we met with our Mexican colleagues, made brief presentations, and answered questions.

As the meeting progressed we realized that one of the major issues that needed to be resolved was how to handle the differences that existed among us. These differences were of two kinds. There were differences in interests, deriving largely from our different academic backgrounds; these manifested themselves in the choice of issues that we would address in our chapters. But, also, there were differences of a deeper nature, on some of the issues included in multiple chapters. Neither of these differences was unexpected; they had been a source of mutual stimulation and joint discussion from early in the project.
Rather than ignoring or attempting to downplay these differences, we decided to take advantage of them. We came to realize that these were the kinds of differences that quite likely would be evident among those examining current or considering future doctoral programs in their own institutions. Consequently, we began to think of the differences in the same way as we thought of our contributions to the Mexican workshops; that is, they were alternative perspectives and possibilities. Instead of passively absorbing a unified position that was being canvassed, the reader is invited to join the conversation that has taken (and is still taking) place between and among us, and to formulate a reasoned position that fits with his or her own background and social, national and educational context. Because there are no universal solutions to the problems involved in setting up and operating a quality doctoral program, educators would be wise to be aware of the alternatives at their disposal and make informed choices based on an understanding of their institution and the larger societal context.

In the first chapter Professor Ulrich Teichler describes the diversity of doctoral programs across disciplines and countries. He introduces us to two main traditions of doctoral education and training, the German tradition and the tradition in the United States, and comments on the differences between them. Professor Teichler discusses the expansion of higher education as a matter requiring “constant reconsideration of the nurturing of future generation of academic, researchers and persons professionally active in other highly qualified occupations.” His chapter concludes with a commentary on the role of the doctorate in the overall educational system as well as its role in the career development of academics and other professionals.

In the second chapter Professor María de Ibarrola presents a national case study on the origins and expansion of modern educational research and educational doctoral programs in Mexico. Her analysis is organized around three primary questions. First, why has educational research come to be accepted as a prestigious and recognized field of research in the country and when did that occur? Second, how did national policies on scientific research and the explosive growth of the school system in the country, mainly higher and graduate education, influence the role of educational research and the growth of doctoral programs in education? Third, what has been done (and needs to be done) to ensure quality and rigor in doctoral programs in education, particularly when having to cope with difficult situations such as the relatively small number of qualified teachers, the time available for part-time students who work while attending classes, and a general lack of resources.

In the third chapter Professor Gavriel Salomon suggests that many students come to graduate studies after years of practice in education – as teachers, administrators, curriculum or program designers, and/or researcher and evaluation specialists. To accommodate these differences in entry levels and personal goals, he believes that there is an inescapable need to develop a genuine and clear distinction between scientific (Ph.D.) and applied (Ed.D.) doctoral programs. The two types of programs are marked by the different “universes” awaiting doctoral graduates: to advance the science of learning, on the one hand, or to advance the
practice of learning, on the other. The graduate of the Ph.D. program is generally looking for “patterns of differences” while the graduate of the Ed.D. program is most often looking for “differences of patterns.” Both programs, however, require collaboration with the universe of educational systems and organizations in which the educational research and practice take place.

In the fourth chapter Professor Lorin Anderson poses as his key question one of the most important issues we debated as a group: What is the proper role of research in doctoral programs of education? He introduces us to the historical debate between a degree for academics and a degree for professional educators in the USA in the early 20th Century and suggests that research began to lose importance as alternative doctoral degrees were designed and implemented. He suggests that the proper role of research in doctoral programs depends on the particular definition of research used. Specifically, is research defined in terms of its methodology, the body of knowledge the studies yield, or a way of thinking (i.e., disciplined inquiry)? Professor Anderson argues that if research is defined as a way of thinking, then it is central to all doctoral programs. By “central,” however, he does not mean “exclusive.” Doctoral programs in education must include substantive knowledge and research skills to produce graduates who both understand and can engage in meaningful, relevant research.

In the fifth chapter, Professor Denis Phillips argues that we need to rethink doctoral programs in education, while at the same time executing a series of “small things” that can be done immediately to strengthen doctoral programs in education. Part of the “rethinking” involves an awareness that educational phenomena, in general, and doctoral programs, specifically, are quite complex. To illustrate this complexity he describes four universes in which doctoral candidates live and work: (1) research frameworks, (2) discordant social contexts, (3) substantive knowledge and (4) professional infrastructure. Professor Phillips also addresses the difficult concept of quality as it applies to research in education. He suggests that research quality can be defined as a function of methodological rigor plus an “X” factor. The “X” factor includes criteria such as originality, relevance, contribution to disciplinary knowledge, and clarity of expression.

The sixth chapter is intended as a transition from more abstract, theoretical matters raised by the authors to practical concerns of those interested in reviewing, designing or redesigning doctoral programs in education. It is organized around a set of a seven questions, each of which was agreed upon by all or virtually all members of the writing group, as a key question that should be considered and answered as one reviews, designs, and, perhaps, redesigns doctoral programs in education. Following each question there is a brief discussion of alternative answers, with the “correct” answer dependent on contextual factors such as cultural norms and expectations, type and size of institution, and age and expertise of faculty members.

This book, then, represents a diversity of viewpoints and suggestions on what we believe to be the key questions that should be asked in reviewing, designing, or redesigning doctoral programs in education. Armed with the key questions and a variety of possible answers to each question, our hope is that the information and
insights contained in this book will enable the reader to consider a wider variety of options as he or she seeks to enhance the quality of doctoral education and training programs in their institutions and, perhaps, in their states, regions, or nations.

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March 2014
1. DOCTORAL EDUCATION AND TRAINING: A VIEW ACROSS COUNTRIES AND DISCIPLINES

Deliberations on the character of doctoral education and training in the discipline of education are central to this volume. This chapter provides a framework for the deliberations in the subsequent four chapters. First, I will sketch the variety of approaches to doctoral education and training across disciplines and across countries. Second, I will show how the discourses and reform approaches with respect to doctoral education and training are embedded into quantitative and structural changes in higher education, in changes of the academic profession, and in the increasing diversity of employment and work of doctoral degree holders.

In the framework of this chapter, special attention is paid to the discourse and the developments in economically-advanced countries. As regards other countries, it is more difficult to identify the major thrusts of research training, the role of research at universities, and notably the extent to which options are coincidental adaptations rather than reflections of the specific needs of the country. As a consequence, in-depth analyses would be needed to provide a valid overview and such analyses are beyond the scope of this chapter (see for example the difficulties of mapping the research role in other countries in Vessuri & Teichler, 2008).

THE LINK BETWEEN RESEARCH AND TEACHING AND THE TRADITIONS OF DOCTORAL EDUCATION AND TRAINING

The results of many historical studies have indicated that a close link between teaching and research became the credo of academia in the 19th century. Furthermore, the “idea of the university” formulated by Wilhelm von Humboldt and incorporated into the newly founded University in Berlin in 1810 was the actual visible starting point of this development. Although the Humboldtian principles of “unity of research and teaching,” “solitude and freedom” as well as “community of teachers and students” are often cited by scholars, notions differed widely across countries in the 19th and 20th century about the function of a university, the character of research, the balance of teaching and research in the academics’ identities and activities, and the desirable ways of nurturing doctoral candidates and young scholars (that is, features indirectly or directly affecting doctoral education and training).

We note, for example, substantial differences by country in the typology of higher education and research institutions in terms of the link between teaching and research. The term “university” was confined in many of the countries strongly influenced by the Humboldtian principles to multi-disciplinary doctoral-degree

M. de Ibarrola & L.W. Anderson (eds.), The Nurturing of New Educational Researchers, 1–25. © 2014 Sense Publishers. All rights reserved.
granting institutions with a strong emphasis on both research and teaching. Over the years in some of these countries, mono-disciplinary doctoral granting institutions with a strong emphasis on both teaching and research could be called universities as well. In countries such as Austria, Finland, the Netherlands, Norway, Switzerland and Germany institutions with a dominant teaching emphasis and without the right to award doctoral degrees are not officially named universities, but they like to call themselves unofficially “universities of applied sciences” in order to claim a higher prestige through closer vicinity to the universities. In other countries, such as Japan and the Republic of Korea as well as many developing countries, the English term “university” is used as the official designation for all higher education institutions awarding a bachelor’s degree, whether or not they award a doctoral degree. Moreover, while most research in the public domain takes place at universities with a link to teaching, in some countries a substantial proportion of research in the public domain is allocated in separate research institutes outside higher education or as research institutes without teaching functions within universities.

We also note the enormous differences in the roles that research, teaching, and possibly other functions play in the identity of university professors irrespective of the common reference to the Humboldtian ideal of a strong link between teaching and research. On the basis of the largest comparative studies on the academic professions undertaken since 2000, the Japanese higher education researcher Akira Arimoto (2010; see also various articles by Altbach, 1996; Shin et al., 2014) concluded that three types of academic identities prevailed in various countries in the 1990s, with small changes as in the first decade of the 21st century:

In what he refers to as the German model (Type 1) Arimoto confirms the widespread view that research has been the key source of identity for university professors in those countries that follow most closely the Humboldtian principles (notably the German-speaking countries, the Nordic countries, some other continental European countries as well as in Japan and the Republic of Korea). In these countries, teaching has not been conceived of as requiring substantial professional competence and reflection. Students have been understood as learners to be confronted with logics of research from the beginning of study, and the nurturing of the young scholars has been in the hands of an individual Doktor-Vater and his or her approaches to academic socialization. Academic freedom has been held in high esteem although the extent of institutional autonomy has varied among these countries, not infrequently with a tacit understanding that the benevolent government would take care of some issues in a better way than the community of scholars led by a rector as primus inter pares. Even Wilhelm von Humboldt himself was not convinced that university professors would do the best job in assessing other academics in recruitment processes.

Arimoto refers to his second model as the Anglo-Saxon model (Type 2). In this model, academics not only praise the close link between research and teaching, but also stress research and teaching equally in their academic work. In teaching young students the emphasis is placed on learning and personality development, while
encounters with the logics of research might be reserved to more advanced stages of study.

Finally, Arimoto labels his third model the Latin American model (Type 3). It is likely, however, that this label reflects the country composition of the comparative survey analyzed since it can be observed in other countries as well. Regardless, however, in this model the identity of university professors is primarily shaped by their teaching function.

Within Arimoto’s framework, differences by country in the institutionalization of doctoral education and training deserve special attention. The Humboldtian interpretation that developed in the United States with respect to the nurturing of academics is clearly distinct from that of the European countries. Although some universities in the United States were inspired in the 19th Century by the Humboldtian principle of a close link between teaching and research, they selected certain elements, disregarded others, and invented still others, all in the name of these principles. No matter whether these changes are referred to as “adaptation,” “reformulation,” or “creative misunderstanding” (see for example Perkin, 1991), the concept believed to resemble the Humboldtian idea emerged in the United States was clearly different from the German and other European implementations in three respects. The first was the prevailing belief in the United States that there can be a peaceful coexistence between academic freedom and strong university management. The second was the belief that research-oriented teaching is only typical in advanced stages of teaching and learning (thus creating a distinction between undergraduate and graduate education). The third was the establishment of organized doctoral education and training in the framework of specific sub-units within universities, the so-called “graduate schools.”

Actually, a variety of concepts and modes of nurturing the next generation of academics has developed in various countries and at different institutions. For example, the educational system in Japan after World War II incorporated many features of the system in the United States. As regards doctoral training, participation in doctoral programs became the regular route towards a doctoral degree, but in contrast to the United States, master and doctoral programs were strictly separated in Japan. Furthermore, doctoral programs were organized and supervised by the respective disciplinary faculties in charge of bachelor’s and master’s programs. In recent years, the faculties of some research-oriented universities were renamed “graduate schools” and were placed in charge of bachelor’s, master’s, and doctoral programs.

In the international debate about the character of doctoral education and training, however, the contrast between the German tradition and the tradition that has grown up in the United States is most often taken as the starting point. This contrast is evident in the actual discussions that have gained momentum since the 1980s when the OECD identified doctoral education and training as a key issue of higher education and research policy (see Blume & Amsterdamska, 1987). In this context, the concepts of “knowledge society” and “knowledge economy” (that is, the notion that the future of modern societies will depend more strongly than in the past on research and that countries might lose out if they cannot achieve the
highest level of research) became popular in the 1990s. Attention began to be paid to the visible signs of research quality in the United States as well as to the fact that large numbers of doctoral candidates from all over the world intended to have their doctoral training at research universities in the United States. Consequently, the policy discourse stimulated by the OECD in the 1980s by and large was based on a shared assumption that graduate schools in the United States could become role models for universities in other economically-advanced countries.

Two encyclopedias of higher education, published in the early 1990s, reflect the state of reasoning of that time. The authors of the entries on “Graduate Education” in both of these encyclopaedias were United States’ sociologists who specialized in higher education. Gary Rhoades (1991) described this international discourse as follows:

Graduate education takes different forms from one country to the next. In recent years, however, there has been marked movement internationally to copy the American model. In the United States graduate education consists of accumulating courses and credits, passing examinations, and producing a dissertation. Largely course work-driven, it follows what might be called a professional model, as opposed to what might have termed the apprenticeship model that has characterized European graduate education. (p. 127)

Patricia Gumport’s (1992) formulation was somewhat different.

Over time across national systems, graduate education has shifted away from the nineteenth-century German ideal of uniting advanced study and research with the work of the individual scholars engaged in scientific research. … the size, form, and content of education, especially the path to the doctoral degree, have come to look more like the American model of prescribed curriculum, coupled with more formalized research training, culminating in a thesis that demonstrates original research. At the same time, the nature of research in the American model as well as that of its international neighbours has evolved toward more utilitarian purposes than the German practices of a century ago. (p. 117)

Looking more closely at the debate in European and OECD countries in the 1980s and 1990s, however, one could argue, first, that one hoped in many countries to find improved ways of doctoral education and training by adapting elements of the higher education in the United States. Doctoral education in the United States was often portrayed as a clear “success story” without any reference to debates about the strengths and weaknesses visible in the United States (see for example Nerad, 2004). As a consequence, one hoped to implement the United States’ model in order to (1) provide a better quality of research training, (2) get useful ideas for the training of researchers, (3) design and implement more comprehensive training for the professional role of academics, and (4) develop doctoral education and training programs that are valuable for those who eventually will be neither academics nor researchers at other institutions.
The international debate on the future of doctoral education has intensified and became more sophisticated over the past twenty years. The strengths and weaknesses of a highly institutionalized and programmed approach versus an individualized apprenticeship approach played a substantial role in this debate. In addition, however, many other issues were on the agenda as well, such as distinct types of doctorates, the range of competences strived for in the doctoral phase beyond the ability to conduct research, and the relationship between training and productive academic work in this phase. Thereby, we note an enormous diversity of views that certainly are based on individual insights and preferences of the actors of this debate, but clearly reflect as well different conditions of national higher education and research systems and their societal contexts. These different views within countries and different dominant realities across countries can be examined on seven major dimensions:

1. the extent of expansion of higher education,
2. the extent and modes of diversification of the higher education and research systems,
3. the quantity of doctoral degrees as well as the academic and other whereabouts of doctoral degree holders,
4. the role of the doctoral phase in the overall education, training, and career development of academics,
5. the role of doctoral training in the context of overall training and career development for those persons who eventually are professionally active outside academia,
6. the overall situation and role of junior academics, and
7. the changing views of desirable competencies and job roles of academics.

These dimensions became visible in various studies that aimed at understanding the situation of doctoral education and training in the wider context of higher education and its societal functions and from a comparative point of view. For example, they were already evident in a study on the notions of research in graduate education coordinated by Burton R. Clark (1993, 1994), in a review undertaken in the first years of the 21st century on “doctoral studies and qualifications” in Europe and the United States initiated by the European Centre for Higher Education (CEPES) of UNESCO (Sadlak, 2004; see notably Kehm, 2004), and in publications of a “global network” of researchers analyzing “doctoral education worldwide” and a possible trend “towards a global Ph.D.” (Nerad & Heggelund, 2008; see also Kehm, 2012). Also, the proceedings of conferences arranged by the Academia European on the “formative years of scholars” (Teichler, 2006) and UNESCO (UNESCO Forum on Higher Education, Research, and Knowledge, 2008) are helpful in this respect.

In sum, there are varied experiences in economically-advanced countries based on past models, and there are varied new challenges that call for new solutions. Also, there are good reasons to assume that solutions frequently found in higher education across disciplines are not necessarily most suitable for the conditions, challenges, and tasks of individual disciplines. Therefore, a look at the discourse on graduate training across countries and across disciplines, as referred to in the first
half of this contribution, can be viewed as helpful for enriching the search for future solutions of doctoral education and training in the domain of education. In the remainder of this chapter, I address some of the elements that are quite similar across countries as well as other elements where substantial differences between countries can be noted.

EXPANSION OF HIGHER EDUCATION AND ITS IMPLICATIONS FOR DOCTORAL EDUCATION AND TRAINING

The international debates on possible improvements of doctoral education and training tend to refer to the expansion of higher education as a major factor requiring constant consideration. Whatever the perceived causes of this expansion, the growing size of the academic and research system is worth monitoring.

The expansion of higher education is most frequently described in terms of its teaching and learning function; that is, the growth in the number of student who enter, continue to enroll, and graduate from higher education institutions relative to the total number of students in a respective age group. The entry rates in higher education increased from less than 5% of an age group in the majority of economically-advanced countries in the 1950s to more than 50% in the majority of economically-advanced countries in the first decade of the 21st century. In many other countries, the entry rates were clearly lower than in the economically-advanced countries some decades ago, but the subsequent growth rates were even higher in many of the low- and middle income countries than in economically-advanced countries.

Although the discourse on the causes and consequences of the expansion of higher education seems to be similar across economically-advanced countries, the actual figures vary enormously. Consider, for example, graduation rates (see OECD 2012). In 2010 the percentage of higher education graduates with at least a bachelor’s degree was at least 50% in Iceland, Poland, Slovakia, the United Kingdom, Australia, New Zealand, Denmark, and Finland, as compared to 40% in Japan, 38% in the United States and 30% in Germany (with the OECD average being 39%). If we add the tertiary education graduates of shorter, more vocationally oriented programs in 2010, we note that the respective rate was about 60% or higher in Iceland, Australia, New Zealand, the United Kingdom, and Japan (and possibly in Finland and Korea where OECD data were missing). These rates compare with the OECD average of 50% (with 49% in the United States and 44% in Germany).

As the United States is often viewed as a role model for “organized” or “programmed” doctoral education and training worldwide and as Germany is often regarded as the prototype of the “apprenticeship” model of education and training of individual doctoral candidates, a closer look at higher education expansion in these two countries seems appropriate. The United States was leading the worldwide expansion of higher education during the first widely discussed wave of expansion in the 1960s and 1970s. However, the United States currently is near the OECD average because higher education expanded more substantially in other
DOCTORAL EDUCATION AND TRAINING

countries during the second wave of expansion since the mid-1980s. In contrast, Germany had been among the economically-advanced countries with the lowest entry and graduation rates consistently over the years. However, the substantial increase in entry rate (up to about 50%) is so recent that it has not yet affected the graduation rate calculated from available statistics.

Irrespective of these quantitative variations, the conventional wisdom of the expert debate has been similar in these countries. First, it is often pointed out that students and graduates became more diverse as far as their talents, motives and job prospects as higher education expanded (see Huisman, Meek, & Wood, 2007; Teichler, 2008). Therefore, as will be discussed below, these students may be better served through growing diversity in higher education institutions and programs. Second, higher education might have expanded to a lesser extent if the needs for extending and replenishing academics and other research staff had been the major driving force for this trend. But this is not the case.

The rates of doctoral degrees awarded had been below 1% in all countries for many years and were not seen as an issue in the general debate on higher education. For example, the chapters on the United States, the United Kingdom, France and Switzerland in the first major international encyclopedia of higher education (Clark & Neave, 1992) did not provide any information about the number of doctoral candidates or the number of doctoral degrees awarded. With respect to the Federal Republic of Germany, however, the number of doctoral degrees had risen from about 10,500 in 1975 to about 14,500 in 1986, an increase from about 1% to about 1.5% of the corresponding age group (Kehm & Teichler, 1992).

Only in recent years has the expansion of doctoral degrees been referred to in the general discourse on the quantitative and structural developments of higher education. An average of 5% annual growth of doctoral degrees across OECD countries is reported for the first decade of the 21st century, raising the rate of doctoral awards of the respective age group from less than 1% on average in 2000 to 1.6% in 2010 (OECD, 2012).

Actually, the rates of doctoral degrees (and similar advanced degrees) have varied substantially by country over the decades and continue to vary more substantially now than the rates of bachelor’s and master’s degrees combined. According to 2010 data, the highest doctoral degree rate can be found in Switzerland (3.6%), Slovakia (3.2%) and Germany (2.6%) as compared to the OECD average of 1.6% (with 1.6% in the United States, 1.1% in Japan, and only 0.5% in Poland).

Interestingly, the proportion of foreigners awarded a doctoral degree was about one-fifth across all advanced countries. This proportion is higher in Switzerland and the United States, where more than two fifth were foreigners. In Germany, in contrast, the figure is about one-tenth in recent years.

Comparative rates of doctoral degrees must be viewed with caution because the figures presented in official national statistics and in statistics presented by UNESCO, OECD, and other supra-national agencies include only academic doctoral degrees in the United States (i.e., not professional doctoral degrees – see
the discussion of these differences below), but as a rule all doctoral degrees in most other countries.

In sum, the data and the respective discourse suggest that the expansion of doctoral education and training certainly has been affected by the overall expansion of student enrollment and by the respective need for an increase of academic staff in higher education. At the same time, however, the expansion of doctoral education and training did not follow closely the patterns of the overall student enrollment across countries, a finding that suggests that other factors are in play in the development of doctoral education and training than merely the issue of reproduction of the academic profession (as will be discussed below).

THE QUANTITIES OF DOCTORAL DEGREES AND THE WHEREABOUTS OF DOCTORAL DEGREE HOLDERS

Many factors might contribute to the enormous variation of the rates of doctoral degrees of the respective age group across countries: As already pointed out, the rate of foreigners among them who return to their home countries or go to other countries afterwards might vary. Also countries with relatively high entry rates to higher education have a higher demand for staff with a doctoral degree than those with low entry rates. But the rate of doctoral degrees varies so much by country that a closer look at the role of doctoral education and training for various occupations is necessary.

Generally it is taken for granted that doctoral education all over the world serves the reproduction of the academic profession, that is, the preparation of people who will be professionally active at institutions of higher education primarily in the area of research and/or teaching. Assuming, for example, that (1) all members of the academic profession are expected to be doctoral degree holders after the initial years of academic formation, (2) the student-teacher ratio is 20:1, (3) students study four years on average, (4) academics are professionally active as academics for 30 years on average after the doctoral award, and (5) higher education institutions remain constant over time, a country with a 50% student entry rate would need a 0.7% doctoral degree rate to replenish its academic staff.

Poland is a country that had an entry rate to higher education of more than 50% and a doctoral degree rate of only 0.5%. Thus, too few doctoral candidates are trained to ensure that all academic staff would be doctoral degree holders. In contrast, the OECD average of a 1.6% rate of doctoral degrees and more than 50% entry rates to higher education suggest that at least half of the doctoral degree holders would be employed somewhere else, and this proportion would be even much higher for doctoral degree holders in the countries with the highest annual rate of doctoral degrees awarded and relatively low entry rates to higher education, such as Switzerland.

In the United States the official statistics for 2010 – indicating, as pointed out above, a rate of doctorates of the corresponding age group that is equal to the OECD average (1.6%) – only comprise academic doctorates (Ph.D.s), while professional doctorates are not included. In the United States the annual number of
bachelor’s degree awards is about 30 times as high as that of Ph.D.s. Based on available statistics for the years 2003 and 2004 it has been estimated that more than half of the persons annually awarded a doctoral degree in the United States – about 46,000 at that time – have a chance of taking over a full-time assistant professor position. Furthermore, less than half of these assistant professors eventually move on to senior full-time professorships – associate professors and full professors (see the different calculations in Janson, Schomburg, & Teichler, 2007; Wendler et al., 2010). Thus, if the only purpose of doctoral training was to serve the academic reproduction of full-time associate professors and professors in academia, one quarter of the Ph.D.s produced in the United States serve that purpose. If the Ph.D., in contrast, was seen as appropriately serving assistant professors who later phase out of academia as well as part-time academic staff in academia, possibly three-quarters of the actual Ph.D.s might be needed. According to data collected by the National Science Foundation, about half of the new doctoral recipients who were employed after receiving their doctoral degree in the first decade of the 21st century reported that they accepted a position in academia (Wendler et al., 2010, p. 20).

In Germany, the annual number of graduates with a bachelor’s or master’s degrees is slightly more than ten times those receiving doctoral degrees – the latter about 25,000 annually. Actually, the rate of doctoral awards among the respective age group in Germany is among the highest in OECD countries (2.6% in 2010). Almost one third of the doctoral awards are Dr. med. awards that might be viewed as being similar to professional doctorates in some other countries. According to the most recent information available, more than half of the doctoral candidates in Germany are already full-time or part-time employees at higher education institutions or publicly funded research institutes at the time they work on their dissertations. Subsequent to the award of a doctoral degree, about one quarter are employed at institutions of higher education or publicly funded research institutes and about one sixth in R&D in the private sector. However, more than half are employed outside the higher education and R&D sectors. Many of the doctoral degree holders who start or continue to work at higher education institutions upon the award of a doctoral degree will not reach eventually a professor position. Less than one-tenth of doctoral degree holders eventually become professors at universities and other institutions of higher education or reach similar leading positions in research institutes (see Konsortium Bundesbericht wissenschaftlicher Nachwuchs, 2013).

Varied Professional Whereabouts: An Argument for Varied Types of Doctorates?

Because the categories employed and figures presented vary in national statistics, international educational statistics, and international research statistics, it is not possible to present any reliable comparative picture of the various professional whereabouts of doctoral degree holders. In reflecting on the strengths and weaknesses of available statistics, one widely accepted classification system of the whereabouts of doctoral degree holders is as follows:
1. Members of the academic profession (that is, those predominantly in charge of research and/or teaching at institutions of higher education);
2. Researchers at public or not-for-profit research institutes;
3. Persons in industry and commerce whose professional functions include major components in research and development;
4. Persons professionally active outside the aforementioned job roles in sectors who perform professional tasks with significant research components, research-like components, and/or require in-depth knowledge of research processes and findings. An example would be a higher education professional at an institution of higher education in charge of evaluation, curriculum development, research management, etc. Other examples include a manager of sales of pharmaceutical products to hospitals and a key administrative staff member of a professional association;
5. Persons professionally active without any visible research element or research-like element in their work, but who profit from holding a doctoral degree as a higher level of educational attainment or via the symbolic power of the credential;
6. Finally, there is a residual group of individuals who hold doctoral degrees and who are professional active, but there is no sign that the doctoral degree is professionally relevant in any respect.

Continuing with this discussion, it should be noted that the academic profession itself can be differentiated on two dimensions: (1) whether a doctorate is viewed as an entry qualification or not, and (2) whether research is an official function or not. With respect to the first dimension, a doctoral degree is a required qualification for professors at German Fachhochschulen (that is, institutions primarily in charge of teaching), but not for professors at HBO in the Netherlands or for ammattikorkkuakoulu in Finland. With respect to the second dimension, it has already been pointed out that research is not an official function or an optional activity of academics at some institutions of higher education. Within universities, which are responsible for both research and teaching, not all academics are officially in charge of both. For example, junior academic staff paid through research funds might be solely in charge of research. In contrast, persons might be employed as foreign language teachers without any research responsibilities. And in the United Kingdom, many universities have introduced contracts with individual academics that define shares of work assignment for teaching, research, administration, and so on, whereby many academics, once again, have no official research function (see Locke & Bennion, 2011).

In many economically advanced countries, the number of doctoral degree holders has increased over the years more substantially than that the number of academic positions at institutions of higher education and positions at research institutes. Occasionally, this disparity is depicted as an “over-supply” of doctoral degree holders. We must note, however, that employment of doctoral degree holders in other sectors might be viewed as a desirable development on the way towards a “knowledge society” or “knowledge economy.”
Over the years, the growth of the number of doctoral degrees has elicited debates in some countries as to whether the establishment of different types of doctorates would be the appropriate response to the current situation. Informing this discussion is a list of seven types of doctorates prepared by Kehm (2012) based on a synthesis of the literature in the first decade of the 21st century. The seven types are:

1. the research doctorate with a dissertation as the focus, which is aimed at educating people who will be able to generate new knowledge, with the dissertation itself expected to generate new knowledge;
2. The professional doctorate, which is aimed at preparing graduates for demanding problem-solving in some professional field as well as the generation of applied knowledge. This doctorate is often completed on a part-time basis alongside professional work responsibilities;
3. The “taught” doctorate, where candidates spend substantial time attending courses with work in these courses taken into consideration in assigning final grades. Work on the dissertation requires a small share of the overall time and is to a lesser extent than the research doctorate expected to generate new knowledge;
4. The cumulative doctorate, occasionally referred to as the “Ph.D. by published work.” There is no required program to complete nor is there an assessment of the process of attaining specified competencies and writing a dissertation. Rather, there is an assessment of whether the already available publications are consistent with the quality requirements of the degree;
5. The practice doctorate, which has been introduced in the United Kingdom in order to testify a high level of competence and achievement in fields not having research at the apex of demanding work. Examples of such fields include fine arts, music, design, and so on;
6. The “new route” doctorate, which initially was advocated by some British universities and spread in one way or another to other countries. This doctorate has a strong emphasis on training research methods and specific subject matters as well as efforts to enhance key skills, with a lesser emphasis on the dissertation. In some cases, the master’s thesis or its enlargement can be used as the dissertation;
7. Finally, the joint (European) doctorate, which operates within the framework of a program jointly developed and offered by several universities in various countries. Doctoral candidates are obliged to spend phases of their education and training at various institutions of higher education.

This list cannot be considered as complete. There are approaches, for example, where doctoral candidates are supervised by academics from different universities (different countries, different types of higher education institutions, different areas of specialization). Another example would be “research schools” with a thematic emphasis jointly arranged by several universities. There also are approaches with mandatory internships outside academia (e.g. industry). There are movements as well towards “collaborative doctoral programs” in the context of university-industry cooperation (see Borrel-Damian, 2009). It should be noted, however, that
most of these discussions and activities have not led to the official establishment of distinct types of doctorates. Only some countries, notably the United Kingdom, Australia, and New Zealand, have moved towards serious discussions and steps towards the implementation of a division between an academic and a professional doctorate (see Neumann, 2002).

The various types of doctoral education and training, whether actually implemented or not, are not consistently linked to the professional whereabouts of doctoral degree holders. This comes as a surprise, because different professional whereabouts are often given as the rational for the establishment of different types of doctoral education and training. Two reasons can be given for this lack of a consistent linkage between type of doctoral education and training and professional whereabouts. First, certain types (e.g., doctoral training with periods abroad) might contribute to competencies valuable in a variety of sectors of employment and work. Second, the diversity of the whereabouts of doctoral graduates is not automatically an argument for a corresponding diversification of doctoral education and training. Neither universities nor doctoral candidates know for certain at the beginning of doctoral education and work whether and which candidates are likely to move to which professional sectors after the doctoral award. Furthermore, many persons awarded a doctoral degree are professionally active in academia for a while and move to other sectors afterwards.

SPREAD OF DOCTORAL PROGRAMS – A MOVE TOWARDS GLOBAL CONVERGENCE?

As already has been mentioned, the expansion of doctoral education and training as well as the widely perceived “success story” of graduate schools in the U.S. has led to the establishment and rapid expansion of doctoral programs in many other economically-advanced countries in recent years. According to surveys undertaken by the European University Association (EUA), the proportion of universities in Europe that are responsible for both teaching and research and offer at least one doctoral program has grown from less than 30% in 2007 to more than 80% in 2012 (Byrne, Jorgensen, & Loukkola, 2013, p. 15). Obviously, however, the proportion of doctoral candidates actually being educated and trained within doctoral programs remains a minority across Europe. Even in Germany, though, the country usually named as the prototype of the traditional “apprenticeship” model of doctoral training, doctoral programs have increased quite substantially since the early 1990s.

THE ROLE OF THE DOCTORAL PHASE IN THE OVERALL EDUCATION, TRAINING, AND CAREER DEVELOPMENT OF ACADEMICS

Doctoral education and training in most countries – not only economically-advanced countries – is dominated in its conception by competencies consistent with the assumed needs of the academic profession. Therefore, a look at the role of the doctoral phase in overall education and training as well as in the career
development of academics is in order. Such an examination might help explain the options strived for in the establishment of doctoral programs.

According to the survey “The Changing Academic Profession” of regularly employed staff working at least half-time at institutions of higher education offering at least bachelor’s degree programs undertaken in 2007/2008 in almost 20 countries, more than 90% of the respondents in the Republic of Korea and Canada were doctoral degree holders. The respective figure was less than 80% in the United States and less than 70% in Germany. It was below 50% in the Netherlands, Portugal, Finland, and Italy (Teichler, Arimoto, & Cummings, 2013). To interpret these numbers properly, however, one has to take into consideration a variety of factors. They include:

1. the role that the doctorate plays at higher education institutions that are characterized by a dominant teaching function. While a doctorate is customary for those holding senior academic positions at these institutions in many countries (e.g., Germany), it is not true in the Netherlands or Finland where less than one-fifth of those in such positions hold a doctoral degree;

2. whether employment as regular university staff is customary at the time the doctoral candidate is working on the dissertation or only after the award of a doctoral degree. For example, as already mentioned, more than half of doctoral candidates in Germany are university employees, while doctoral candidates in the United States as a rule are students (possibly paid as auxiliary staff);

3. whether there are middle-level positions at universities open to persons without a doctoral degree that might be terminal career positions (for example, foreign language lecturers at German universities);

4. the size of the aforementioned groups of academic staff in relation to professors at universities with joint responsibilities for research and teaching. For example, the proportion of associate and full professors in charge of research and teaching relative to all academics at these universities often vary by country, from more than one-half to less than one-tenth (Teichler, Arimoto, and Cummings, 2013); and

5. the proportion of professors at universities responsible for teaching and research who hold doctoral degrees.

Looking at recent developments and public discussions on the role of the doctorate in academic careers in economically-advanced countries, we note convergent trends in some respects. But differences by country remain salient in others. We note that holding a doctorate is not the entry qualification for the first step of university careers in all economically-advanced countries. In some countries, work on the dissertation continues to be viewed as the first step of an academic career. In the framework of the so-called Bologna-Process, the doctoral stage was advocated to be understood as the “third cycle” of levels of study programs and degrees in some of the communiqués of ministerial meetings; however, no agreement was reached among the participating countries with respect to any specification beyond a semantic reordering. In fact, the prevalent view in those European countries that embrace the Humboldtian principles (that is, the German-speaking countries, the Netherlands, some Nordic countries) is that doctoral candidates are not students.
Rather, they are young researchers who are simultaneously engaged in learning and building up competencies and in undertaking productive academic work. In contrast, the learning dimension and the status of a student dominate in the doctoral stage in some other European countries.

Additionally, we note that in most economically-advanced countries a doctorate is an entry qualification for an intermediate career stage at universities as a rule, but the views vary as regards to the extent this intermediate career stage is similar in terms of the rights and duties of professors. In most countries, academics at the intermediate career stage do not (yet) have all the rights, privileges, and duties of professors. The titles of those who are in this intermediate career stage might range from assistant professors to assistants, their work tasks might be relatively similar to those of professors or have stronger elements of research as preparation for further career advancement, and the degree of job security might be similar to that of professors or clearly less. In countries in which academics at this stage had been clearly subordinated to professors in the past, we observe recent changes toward an assistant professor with a more impressive title, more independent work, and more transparency of career progression. There is not necessarily, however, increased job security (see Enders & de Weert, 2004).

Furthermore, over the year the doctorate has progressed as a prerequisite for the later entry into senior academic positions, positions that might be divided into full and associate professors or might be characterized by a single title with various sub-categories, a single title, a single category, or the title “professor” that is applicable only for some, but not all, senior positions). Some decades ago, a doctoral degree was conceived already as a “must” for being appointed as a university professor in some countries (e.g., the United States and Germany) where most professors without such a title were found in the fine arts. In other countries, however, a doctoral degree was not seen as mandatory (e.g., Italy, Japan and the United Kingdom). According to the 2007/2008 survey mentioned earlier, more than 90% of university professors in Germany and the United States held doctoral degrees, whereas in Japan this figure was 85%, in the United Kingdom 78%, and in Italy 33% (Teichler, Arimoto, & Cummings, 2013, pp. 80-81).

Finally, the entry qualifications for a university professoriate vary by country. In some countries, an advanced degree is typical (e.g., “Habilitation,” Dr. Scientiae). In other countries, a national list of persons considered competent to be offered a professoriate is customary. In still other countries, assessment of the accomplishments during the intermediate career stage is part of the overall assessment in the recruitment of professors without further formal titles and listings. In Germany, for example, the “Habilitation” was the normal entry requirement for a university professoriate for many years, while academic success on a Junior-Professor position or other similar achievements became additional channels in recent years.

In sum, there are variations of the role of the doctorate in the academic careers. These variations, however, can neither be interpreted as calling clearly for or leaning towards a single type and standard of the doctorate nor as calling clearly for or leaning towards multiple types of doctorates.
Increasing diversification is assumed to be the typical reaction of higher education systems to expansion. With respect to potential consequences for the academic profession and eventually for the education and training of future generations of the academic profession, the character of diversification varies substantially across countries (see Guri-Rosenblit, Sebková, & Teichler, 2007; Teichler, 2007, 2008). Five major models of diversity (as well as quite a mix of these models) can be found in various countries.

1. Formal, inter-institutional diversity in terms of the establishment of different institutional types (universities and other institutions of higher education with different names in different countries);
2. Formal intra-institutional diversity, notably in terms of levels of study programs (e.g., bachelor’s and master’s degrees);
3. Informal diversity in terms of “vertical” differences (quality, reputation) or “horizontal” differences (profiles);
4. The proportion of research in the public domain allocated outside higher education; and
5. Functional differentiation among academic staff, possibly both inter-institutionally or intra-institutionally (e.g., some staff only in charge of undergraduate education vs. other staff in charge of various levels; some staff only in charge of teaching vs. others only in charge of research vs. others in charge of both).

The extent and the modes of diversification of a higher education system are enormously important for doctoral education in a specific country as far as the reproductive function of doctoral education and training is concerned. For example:

1. a doctoral degree might be the typical entry qualification for academic careers only in universities in some countries, whereas in others for academic careers in other institutions of higher education as well;
2. a doctoral degree might be the typical entry qualification for academic careers in some countries only if research is a major component of the professional task, but not if academics are solely in charge of teaching. In other countries, a doctoral degree might be the entry qualification also for academics solely or predominantly in charge of teaching;
3. doctoral education and training in some countries might be concentrated in at a few research universities or might be widely spread over a relatively large proportion of universities; and
4. differences in doctorates in terms of the quality and reputation of doctoral granting institutions might be substantial in one country, whereas a respective hierarchy might be relatively flat in another country. For example, it is often said that 50 universities in the United States prepare the majority of doctoral degree holders. In Europe, in contrast, only about 20% of the doctoral
candidates are concentrated at “research-intensive institutions” (Byrne, Jorgensen, & Loukkola, 2013, pp. 9-10). Certainly, conceptions of diversity of doctoral education and training are more likely to flourish in countries where a high degree of diversity is characteristic for the entire higher education system. However, the relationship between these two aspects of diversity cannot be viewed simply as a linear relationship.

THE OVERALL SITUATION AND ROLE OF JUNIOR ACADEMICS

In many economically-advanced countries, the supervision of doctoral candidates by individual professors with the work on the dissertation as the primary, almost exclusive learning activity – the model occasionally called the “apprenticeship model” – was viewed for a long time not only as typical for doctoral education and training, but also as the only systematic training of academics. Over time, several critiques of the model appeared. Kehm (2012), for example, summarized the arguments against the model frequently voiced in Europe. Among them were that the model resulted in students taking too long to complete their degrees; produced too many dropouts; was too highly specialized; relied on questionable and unequal quality of supervision; was dependent to a great degree on a single senior academic; included few training elements for theory, methodology, or academic work techniques; focused too little on the enhancement of professional competencies of academics; failed to prepare graduates for careers outside of academia; offered little in the way of career guidance; and altogether incorporated marginal quality assurance of doctoral education and training.

The view was widely held that many of these issues could be handled more successfully in the graduate schools, similar to those in the United States. In this discourse, as already mentioned, it was often the optimal in the United States being compared with the typical in Europe. Hardly any attention was paid to critiques within the United States pertaining to the “average” graduate school and its widespread deficits (see for example Nerad, 2004).

Nonetheless, various European countries undertook reforms of doctoral education and training using the United States as a role model to a certain extent. However, as already pointed out above, these adaptations differed from the United States mode in three ways. First, as a rule doctoral education and training in Europe remained separate from master’s-level education and training. Second, doctoral programs in Europe tended not be embedded in “graduate schools” but were coordinated by existing faculties. Third, in most European countries, participation in doctoral programs was established as but one option rather than a more or less mandatory route to degree attainment.

Often, proposals for a change of doctoral education in countries without a graduate school tradition do not call primarily for a clear institutionalisation of doctoral education and training, but rather for a professionalization of doctoral education and training. This distinction refers primarily to the substance and processes of academic supervisors and doctoral candidates, although an abundance of managerial tasks might change even if no graduate “schools” are established.
Based on a study on discourses and actual developments in Australia, Neumann (2013) presents a long list of the components needed to professionalize the management of doctoral education, which includes: senior staff appointment with policy and management responsibility for doctoral students; creation of positions of administrative specialization for doctoral study; recruitment of doctoral students in line with university and faculty research strength; articulation of clear roles and expectations regarding doctoral students, supervisors and the university (“supervisory practice policy”); provision of specialized support for research processes and skills beyond supervision; support and programs for the development and maintenance of supervision skills; and quality assurance, with the help of surveys of doctoral students and former doctoral students for example.

Some of the aforementioned comparative studies on doctoral education and training summarize some experiences in this reform process in European countries. There are many “success stories,” but the move towards more programmed and institutionally-embedded doctoral education and training is not consistently seen as a success: “Time to degree,” which in the United States is mostly measured as average time from bachelor’s degree to doctoral award and in Europe from master’s degree to doctoral award, did not become shorter on average. Similarly, “average age at the time of the doctoral award” was not reduced (with are similar trends in the United States). In fact, the multiplication of purposes associated with doctoral education and training in Europe (e.g. increasing interdisciplinarity, professional training of research and teaching skills, fostering of key skills) was likely to increase “time to degree” in many instances. Professors’ engagement in supervision and advice did not necessarily improve when they were embedded in collective arrangements. Issues surfaced that were not resolved in the United States, such as the desire to increase international learning and temporary mobility during the doctoral phase, industrial experience during the doctoral education and training period, attention paid to the diversity of doctoral candidates, and socialization for teamwork in research. Moreover, the conditions of doctoral education and training in doctoral programs might be viewed favorably when compared with individual work on dissertations supervised individually, but not necessarily when compared with doctoral work in the framework of research teams funded by the universities and research institutes or by research contracts.

In Europe, we note on the one hand discussions within individual countries about eventual reforms of doctoral education and training that might reflect national contexts and national priorities. On the other hand, there is a discussion about arriving at common solutions across European countries. The rationales for arriving at common solutions include (1) strengthening Europe academically or economically as compared to other world regions, (2) facilitating international (or intra-European) mobility during the doctoral stage or the early research career stage (see for example the Marie Curie Programme), and (3) providing a basis for international/intra-European professional mobility at later stages of the academic and research careers (see for example European Commission, 2011). Again, views vary as regards the value of European convergence for the purpose of easing
mobility as compared to encouragement and reinforcement of other promising solutions.

In general, the discussion in Europe about needs for improvement of doctoral education and work often did not focus solely on the doctoral phase, but rather on the situation of junior academics or early researchers in general (see Enders, 2001; Enders & de Weert, 2004, 2009). Questions such as the following were raised during the discussion. Are the early phases of academic and research careers sufficiently attractive to mobilize talented young people for academic careers in general and for the European countries in specific (in contrast to the “brain drain”)? Is access to resources sufficient for the needs of research work in the doctoral phase? How are the working conditions in general? What opportunities are there for women and for the compatibility of family and child-rearing with academic careers? How important are the extent and modes of selection within the academic careers? How does short-term employment affect the attractiveness of academic careers?

Within this framework, one often hears debates and sweeping generalizations which do not necessarily coincide with results of research on academic junior staff and young researchers. According the 2007/2008 comparative survey of the academic profession, for example, 61% of doctoral candidates employed at German universities during the first six years after graduation stated that they were satisfied with their overall professional situation – slightly more than those who had previously been awarded a doctoral degree (55%). Satisfaction was only low among those employed doctoral candidates who had not reached a doctoral degree within six years after graduation (36%). Altogether, the proportion of junior staff at German universities stating overall professional satisfaction increased from about 40% in 1992 to 55% at the end of the first decade of the 21st century (see Jacob & Teichler, 2011, p. 144). Academics employed at universities at the doctoral stage are, in the majority of academically-advanced countries, more satisfied with their situation than intermediate-level academic staff holding a doctoral degree (Konsortium Bundesbericht wissenschaftlicher Nachwuchs, 2013, p. 323). It seems necessary to look more carefully at empirical evidence about the situation of doctoral candidates and young researchers as basis of suggestions for improvement.

It might be added that the debates regarding the strengths and weaknesses of the “program” model and the “apprenticeship” model seem to take for granted that the level of competence at the award of the doctoral degree does not differ systematically between these two models. There are, however, different historical traditions pertaining to the expected years of academic learning and work on which a doctorate is based. In Japan and in various Northern European countries, more than three years of study was considered as typical. Furthermore, the doctorate was viewed in these countries as more demanding than in the United States. Nonetheless, in recent years the view has spread across economically-advanced countries that three years of learning and academic work beyond the master’s degree is the norm. Furthermore, the research-based competencies expected to be
DOCTORAL EDUCATION AND TRAINING

achieved at the stage of the award of the doctoral degree are not differentiated according to the “program” and “apprenticeship” model.

CHANGING VIEWS OF THE DESIRABLE JOB ROLES AND COMPETENCES OF ACADEMICS AND THE TASKS OF DOCTORAL EDUCATION AND TRAINING

Efforts to improve doctoral education and training in order to better prepare the doctoral candidates for future academic careers have to take into consideration changes in the working conditions and tasks expected of academics and researchers. In the framework of the recent research projects on “The Changing Academic Profession” and “The Academic Profession in Europe,” the following six issues were most often named as making academic work more challenging today than in the past (see Kogan & Teichler, 2007; Kehm & Teichler, 2013):

1. coping with the conditions of new modes of governance and management;
2. succeeding under conditions of increased competition;
3. teaching and advising a more diverse student body;
4. handling more complex tasks of research and personnel management;
5. providing more visible evidence of the efficiency and relevance of academic work; and
6. acting in a more international and global environment.

In general, it is assumed that the university setting has become more complex as have the tasks of academics. It is often argued that not only do the university management and the newly spreading “higher education professionals” (occasionally referred to as “middle-level managers” or even “third space professionals”; see the overview in Schneijderberg & Mercator, 2013) have to become more professional, but so do the academics. Even though some of the growing complexity of the academics’ work tasks might be alleviated by the growing importance of higher education professionals at universities, most observers believe that academics’ tasks are bound to become more complex irrespective these alleviations. There is greatest consensus that academics in most countries must become more professional with respect to their teaching role (see for example European Science Foundation, 2012). However, a professionalization of academics is also called for on dimensions of management, work organization, and communication. If, in fact, the role of academics and researchers is so much in flux, this is bound to have enormous implications for doctoral education and training.

DIFFERENCES ACCORDING TO DISCIPLINES AND THE CHALLENGES FOR EDUCATION AND TRAINING IN THE DOMAIN OF EDUCATION

The analysis thus far has addressed doctoral education and training in general (that is, across contexts and disciplines). In order to reflect doctoral education and training in the domain of education, a short glance at differences according to disciplines is indispensable.
In examining the frequency of doctoral awards, statistical data on the European Union show that, on average across EU countries, 10% of graduates of the year 2009 had studied education and teacher training, but only 3% of the doctoral awards in 2009 were in education and teacher training. In terms of individual countries, Germany is close to the EU average in both per cent of graduates and per cent of doctoral awards (10%/3%). The respective figures were 12%/12% in humanities, 36%/18% in the social sciences, 9%/27% in the natural sciences, 13%/15% in engineering, 15%/19% in health and welfare, and finally 5%/6% in other fields (see EURYDICE, 2012, p. 174, and Konsortium Bundesbericht wissenschaftlicher Nachwuchs, 2013, p. 163). Across all EU countries “education and teacher training” and “economics and business studies” are the two large fields where relatively few tertiary education graduates progress to doctoral award.

We might assume that a relatively high proportion of persons awarded a doctoral degree in the domain of education eventually pursues an academic career. However, this is by no means certain, because the number of junior staff positions in this area is likely to be small. Moreover, many academics teaching students in education and teacher training might have been awarded a doctoral degree in another discipline (such as various social sciences and disciplines related to subjects in school). I know of no study that traces academic careers of professors in education and teacher training in detail.

The domain of education is best viewed as a multi-faceted field nourished by various disciplines (e.g. pedagogy, psychology, and sociology) rather than a single discipline. Therefore, we have reasons to assume that a search for a consensus about the rationales and modes of doctoral education and training faces more obstacles in the domain of education than in any single discipline (such as psychology).

A further observation worth noting is that in many countries education is a domain in which a sizeable proportion of university professors are employed outside academia before being appointed as university professors. In addition to education, in Germany, this holds true for engineering and fine arts. This suggests that professional experience can be valuable for academic work in these fields; furthermore, doctoral education and training for doctoral candidates in education in these fields may be more similar to that for professional practices outside academia than in the case in many other disciplines.

It seems reasonable to assume that discourses among scholars about the most appropriate doctoral education and training is more sophisticated in the domain of education than in many other disciplinary areas. After all, the scholars in the domain of education are specialists in matters of competence enhancement, socialization, and links between the generation and utilization of knowledge and abilities. Therefore, they have a better professional basis than most others in reflecting and improving the education and training of their potential successors.

There are several other features occasionally mentioned as relevant for the specific conditions of doctoral education and training in the domain of education. Although it is not possible to provide a complete list, we can provide some examples. The relatively low income of teachers in many countries might be an
impediment for part-time doctoral study. In some countries, education as an academic domain has a questionable reputation as far as academic quality is concerned. Furthermore, the role of doctoral awards in a country might depend on the respective modes of initial professional training and in-service training as well as the customary competencies and qualifications of teaching and training staff in these areas.

Altogether, the available information suggests that doctoral education and training in the domain of education cannot simply be viewed as a typical “mainstream” case of doctoral education and training in general. There are too many specific features to rely on conventional wisdom as regards doctoral education and training. Aspects of “conventional wisdom” might be taken into consideration in our reflections on the domain of education, as in the subsequent chapters of this book and related publications (see De Ibarrola, 2012; Spencer Foundation, 2009), but we also may benefit from a glance across disciplines.

THE MANY MEANINGS OF HIGH-QUALITY AND RESEARCH-ORIENTED DOCTORAL EDUCATION AND TRAINING, AND THE MANY MEANS TO PURSUE

When scholars of a disciplinary area meet, discuss the current strengths and weaknesses of doctoral education and training, and consider possible improvements, they easily can agree, at first glance, that the doctoral candidates should be guided to understand and master the highest possible level of research and that a major element of such a competence-enhancement process would be research work leading to a dissertation. In addition, they might be expected to agree that this tradition should not get lost. Finally, they certainly consider at least the apex of the doctoral education training system as being clearly embedded in research. For example, the first sentence in the formulation of principles on doctoral programs formulated by politicians and academics in the framework of the Bologna process says: “The core component of doctoral training is the advancement of knowledge through original research” (European University Association, 2005).

Once one looks beyond such general agreements of the ideal processes and functions of doctoral education and training, however, one encounters a variety of perspectives on many other issues. If we examine several policy reports aimed at analyzing the state of doctoral education and training and its future directions, we can observe widespread support for the notion that research-oriented doctoral education and training, in principle, is upheld as the undisputed goal. At the same time, however, we cannot hope but note that this ideal is under pressure functionally. This pressure comes from a variety of sources, including

1. the expansion of academia that implies an endangering of the top quality expectations;
2. beliefs that upholding high standards for doctoral education and training leads, on average, to lengthy “time to degree” and high dropout rates in various countries (for the United States see Wendler et al., 2010, pp. 28-32);
3. questions about the key functions and competencies of academics. For example, what are the implications for doctoral education and training that most senior academics at “research universities” are in charge of both teaching and research and spend at least the same amount of time on research as on teaching (see Shin et al., 2014)? What are the implications for doctoral education and training that the areas of research expertise have increasingly become narrower than the expertise required to cover the teaching responsibilities of a professorship (see Clark, 1996)?

4. changing perspectives on the character of academia, for example, the widely advocated “professionalization” of the academic profession in terms of expertise in teaching and learning, research management, communication, and other tasks;

5. increasing research activities outside academia, often combined with more instrumental expectations of contributing to transfer and innovation (including possibly increasing research collaboration between academia and industry or other sectors; see European Commission, 2011);

6. the spread of high-level occupations without an explicit research function where a doctorate become a typical high attainment level;

7. a high degree of uncertainty and risks in academic careers that might call for being prepared in the doctoral phases for various professional whereabouts.

This leads us to the second sentence in the framework of the aforementioned principles of doctoral education and training within the Bologna process. It reads as follows: “At the same time, it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academics.” Similarly a report of the Commission on the Future of Graduate Education in the United States emphatically calls for doctoral education and training to both “prepare future faculty” and “prepare future professionals” (Wendler et al., 2010, pp. 43-44).

Even if attention is paid specifically to the purpose, character and expected results of high-quality doctoral education and training, however, we encounter various viewpoints. The following questions are only a few of those being raised and debated.

1. What is the character of a dissertation? Do we expect original research or “less than original” research? Do we call for a “research-like” exercise or actual research? Do we consider a *magnum opus* or possibly a series of articles as the usual result? Do we accept minor forms of dissertations or even the assessment of various other achievements?

2. What are the levels and kinds of mastery of research to be achieved? Do we only award the degree to persons whom we consider to be able to become academics strongly active in research or researchers in other settings?

3. How is quality defined? Does achieving quality mean reaching “excellence” or surpassing a certain “threshold”? Do other definitions of quality enter into the discussion (e.g., “zero errors,” “enhancement,” “fitness for purpose” or even “value for money”; see Harvey & Green, 1993; Kristoffersen, Sursock, & Westerheijden, 1998)? Does the concept of “quality” include “relevance” and “efficiency” or is it viewed as contrasting with these constructs?
4. What are the characteristics of a person trained for research? The European Commission (2011) suggests that “the new academic generation should be trained to become creative, critical, and autonomous risk takers, pushing the boundaries of frontier research” (p. 5).

5. What is the degree of specialization or breadth of expertise to which we should strive? Should we balance high quality in theory, methods, and field knowledge or work toward high quality in select domains? Should we focus on disciplinary specialization or take an interdisciplinary approach?

6. What is the spatial, cultural, or geographic coverage of expertise to which we should strive (e.g., national, regional, comparative, worldwide, universal)?

7. What are the academically-relevant competencies to be enhanced in the doctoral stage beyond mastering research (e.g. socio-communicative skills, team-work abilities, working styles and related values, “transferable skills,” “entrepreneurial skills,” and ethics)?

Finally, views about the proper modes and methods to achieve these goals differ in many respects. What is the appropriate institutional setting for doctoral education and training? What are the desired status, roles, and living condition of doctoral candidates? What are the appropriate roles and activities of supervisors? Should there be more than one supervisor (which is one of the major themes of recent reports and recommendations in both the United States and in Europe)? Should there be institutional arrangements concerning the doctoral candidate-supervisor relationship? In this regards, the EUA (2010) has stated that “supervision must be a collective effort with clearly defined and written responsibilities.” What should be the key components of a doctoral program (e.g., taught courses, presentations of reports to other doctoral candidates)? What are the sequences and modes of interim and final assessments? How important are “career transparency,” career development, and career services to the overall success of a doctoral program?

In light of the vast array of questions we should not reasonably expect an easy consensus on the purposes and modes of doctoral education and training. As a consequence, we also cannot expect a clear convergence of solutions to the problems involved in producing high quality doctoral education and training. Certainly, there is a trend towards more “programmed” structures and towards a greater “professional” handling, but in this framework we note an enormous diversity of options.

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Professor Teichler’s chapter is a great asset. The core of his chapter is the “variety of approaches to doctoral education and training across disciplines and countries.” As such, he sets the stage for the basic argument made in the last chapter, shared by all five authors, that there are no single, unique, or correct answers to the main questions that must be addressed when deciding how best to educate and train educational researchers. After a thorough analysis of differences on numerous dimensions, Professor Teichler concludes that there will not be an “easy consensus”; neither can we expect a “clear convergence of solutions.”

Throughout the chapter, almost in each page, Professor Teichler leads us to consider an enormous variety of differences in the doctoral programs of economically-advanced countries. He approaches these differences from different points of view, from the “implications of the expansion of higher education for doctoral education, to the many meanings of high quality research-oriented doctoral education and the many means to pursue.”

He reminds us of the two basic extreme modes for institutionalized doctoral education and training: (1) a highly structured and programmed curricular approach versus (2) an individualized apprenticeship approach. Differences also exist in the ways in which these two modes combine features “where differences by country deserve special attention.” I would add that differences by institutions within countries also deserve attention in national cases.

A very useful device in Professor Teichler’s text is his systematic lists of the many differences. There are three types of academic identities; at least seven major dimensions for understanding national higher education systems and their societal contexts; at least six categories for classifying the whereabouts of doctoral degree holders; five considerations for differentiating the role of the doctorate in the academic careers; and five ways of understanding the diversification of higher education systems.

We also benefit from clearly articulated critiques of the model that relies heavily on individual supervision of doctoral candidates with the dissertation as the almost exclusive activity. At the same time, however, he raises questions about the actual generalization of the expected benefits of a more programmed approach. He discusses the professionalism of the management of doctoral education and training, referring to changes in the work conditions and tasks of academics and researchers, to the pressures against research-oriented doctoral education and training, to the character and expected results of high quality doctoral education and training, and to ways of achieving its goals. Most of his arguments are

M. de Ibarrola & L.W. Anderson (eds.), The Nurturing of New Educational Researchers, 27–32. © 2014 Sense Publishers. All rights reserved.
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supported by statistical data from fine research sources, among others his own international comparative research on higher education.

The documentation and explanation of these differences provide a good set of options for faculty and administrators at academic institutions who plan on formulating or reformulating doctoral education and training. They also constitute solid criteria references for evaluating the current situation, not only of specific doctoral programs, but also of national policies that may consider the expansion, consolidation, and growth of higher education and doctoral education as well as the production of the necessary human resources in research and development in various disciplines (not only education) for a given country. The richness of his text and of the thoughts and considerations he provokes are a considerable contribution to the development of doctoral education and training in less economically-advanced countries and to the future of doctoral education in general.

CONCEPTUAL UNITY: DIFFERENCES IN PROGRAMS, SIMILAR DEGREE STATUS?

With so many differences and so great a variety of modes and procedures, one could ask, where does unity lie? How is it possible to accommodate all these differences and variations under the concept of “doctoral education and training”? Furthermore, how can a doctoral degree awarded by institutions and programs that differ in so many respects come to be regarded as, basically, the same kind of qualification?

An important dimension to consider in answering these questions is who has the authority, academic or public, to grant the degree and certify an educational program as being a doctoral program. There are, of course, differences among countries. In some, universities grant and certify the doctoral degree; they have done it for centuries. In other countries, it is governmental agencies that certifies the degree together with all other educational certification. In still other countries, professional organizations may also establish graduate institutions and certify the degrees.

Underlying the certification issue are basic considerations on the nature of doctoral education in terms of the unity of the degree, considerations that are being discussed and debated in many countries. The traditional doctoral degree (that is, Ph. D.) is the ultimate, most highly prized degree offered by educational systems. It is granted after the doctoral candidate has demonstrated the capacity for doing research (accompanied by different other learnings that vary according to academic discipline or subject matter). But, what about the so-called “professional doctorate”? Either way, this degree depends ultimately on the evaluation of the candidate by a jury of academic examiners, professors, or researchers from specific individual institutions. There is some current literature that questions the criteria and procedures used for this basic certification.

An examination of any doctoral program in education will quickly reveal the many sources of possible differences: the almost infinite number and variety of students, supervisors, doctoral dissertations, programs, and committees of
examiners. At the other end of the process, different levels of unity are defined and decided by those who are responsible for certifying the degree, from the jury of examiners to the governmental or academic authority vouching for the validity of the degree. In countries where doctoral education and training is having a recent boom these are important dimensions to consider.

QUALITY IN THE DIFFERENCES?

Taking into account the numerous differences, we may also wonder about the quality of doctoral education and training, at individual institutions as well as the policies of an entire country. Which of the possible configurations of a specific mode, within a specific higher education institution, in a specific cultural context, produce better doctoral degree holders? Once again, there is no single answer. Rather, beliefs about quality are expressed in varied ways and included in different definitions. Additional analyses of the criteria and approaches described by Professor Teichler could lead to the construction of different configurations of doctoral programs, according to the way each program classifies defining criteria of quality and the way the unity of the program is achieved and sustained with respect to quality. As Professor Teichler points out, the issue of strengths of one approach versus another is “certainly based on individual insights and preferences of the actors of this debate, but clearly reflect as well different conditions of national higher education and research systems and their societal contexts.” In this regard, an historical approach to the decisions taken by actors who have had the means to do so – within a single institution or within a national policy area – coupled with an examination of the ways in which incumbent actors make and implement decisions should help us understand the meaning of quality and ways of improving it.

ACTORS, PROJECTS, NEGOTIATIONS, COMMITMENTS, AND DECISION MAKING

A brief story about a successful doctoral program in education developed in Mexico may help to understand the articulation of most of the aspects that Professor Teichler shows as variety and differences. The story concerns an inter-institutional doctoral program in education, created with the enthusiasm, decision making, and capacities of the director of the School of Education of an Autonomous State University. At the time, there were only two other doctoral programs in education in the country and there were fewer than 25 doctoral students in education in the entire country. Therefore, the need for more doctoral programs in education was quite clear. Researchers from different institutions were invited to be the professors in charge and formed an academic council. The strategy decided upon was based on the elaboration of a doctoral dissertation under the individual and distant supervision of an established researcher.

Taking advantage of distant education opportunities and procedures, students were responsible for organizing their own study time and interactions with supervisors were based on open, non-scheduled virtual communications. Once each
semester there would be a three day general gathering of all students and all professors and the advancements made by each student were presented to a committee of three supervisors accompanied by their students. There was a final dissertation based on original research and an examination of the student by a proper academic jury.

The most difficult problem the program faced was not the academic design of the program, nor the commitment of professors and students. In fact, the former did not charge for this task; the latter faced the dual responsibility of elaborating their doctoral dissertation and working to support themselves. Rather the main problem was who would grant the degree, since without an academic certification the award would have no value at all. Consequently, one of the most important negotiations for the success of the doctoral program was achieving the consent of the different institutions to accept the participation of their researchers in the project and to allow only one institution to grant the degree and take the credit for the effort. Within the incumbent university, the negotiator had to vouch for the academic quality of the program: the certified doctoral degrees and recognized research activities of each professor was fundamental in that regard.

THE FUTURE OF DOCTORAL EDUCATION AND TRAINING IN THE DOMAIN OF EDUCATION

Doctoral education and training seems to be centered on the teaching/learning of research, whatever vehicle is used to pursue this aim. There are, however, some considerations for the future of doctoral education and training as the exclusive means for the teaching/learning process of doing research as well as for the future of doctoral programs as single-track, research-oriented programs. (This last issue is likely to be the most intensive debate, as most of the chapters of this book suggest). I would add three factors to those identified by Professor Teichler as pressuring the research-oriented doctoral education.

First, consecutive reforms of the educational system are trying to make research activities, tasks, and attitudes a basic and general teaching/learning strategy beginning with preschool. In addition, there are now bachelor’s and master’s degrees that explicitly qualify for professional research. In the future, therefore, it is a possibility that the emphasis on research at the doctoral level of education and training will decrease since, by then, the educational system will have created, hopefully, lifelong researchers. In addition, questions are already being raised as to whether learning research will prepare doctoral candidates and doctoral degree holders to solve the professional problems they are likely to encounter (see Professor Salomon’s position in Chapter 3). If, however, research is conceived as a way of thinking and learning as proposed by Professor Anderson in Chapter 4, then there is the possibility of a different vision of the future. When viewed in this way, research can be compared to the self-sustained perpetual movement towards learning and creation of original knowledge which will not be limited to the world of scientific research. (And there are plenty of examples on that account.)
Second, and on the other hand, the academic world is increasing its entry requirement certification for future academics. There is now, more than ever, a demand for a “post doctorate” certification, which means that professional, academic/scientific research is becoming so complex that an additional upgraded “situated learning” in the company of better positioned researchers, active in research, has become necessary. How long before this level of education and training becomes part of the graduate education structure?  

Finally, the nature of the bond between research and teaching in higher education and beyond is also changing. The bond between research and development (R&D) has been strengthening, not only outside the academic world and not only in terms of technological development, but also in terms of social and educational development. This new bond is changing the mode of producing knowledge (Bourdieu, 1972; Gibbons et al., 1997). Teaching is not considered the only way of transferring knowledge and the dissemination of scientific knowledge among the general public becomes a professional task of its own right.

THE DESTINATIONS OF DOCTORAL DEGREE HOLDERS

Professor Teichler continually refers to the substantial proportion of research now occurring in separate, non-academic research institutes, and informs us that the number doctoral graduates produced exceeds the number needed for the reproduction of the academic life. Some of these graduates, then, may be “professionally active without any visible research-like elements of work.”

After making this point, he wonders if the available data suggests there is a need to create other types of doctoral programs in education, mainly the so-called “professional doctorates.” In doctoral education and training in all disciplines – as at any other level of education – there is not a perfect correspondence of what the education system provides, the destination of the degree holders and what the world of work accepts at a given time. This finding has been established by a whole line of sociological, economical and educational research. Professor Teichlers’ 50 years of research constitutes a major contribution in this arena. He has conceptualized the possible matches and mismatches, horizontal and vertical, between education and employment and related them to structural or dynamic conditions as well as to the imperfections and uncertainties in job requirements, occupational dynamics, and indeterminate work tasks (Teichler, 2009). My own research on the relationship between schooling and work in Mexico show variations according to labor sectors, economic orientations, age, gender, type of schooling, economic cycles, life periods, work trajectories, local or regional employment dynamics, and even specific company policies. Recent research by my doctoral students refer to the different types of knowledge, not necessarily achieved in school, that people rely on and utilize at work and to the difficult transition from school to work, depending on the nature of the education achieved and the labor structure at reach. There is no reason to believe that the destiny of educational doctors in terms of their professional careers could be a perfect match.
A solid line of research in Europe (Beduwe & Planas, 2004) suggests that the educational system is the real planner of human resources in a country. Aligned with this approach, in my analysis of the doctoral programs in education created in Mexico, I would propose that public universities, but mostly the private ones, are responsible for establishing different types of doctoral programs, whether because of the evolution of the academic need to prepare researchers or a market reaction to the demand for the doctoral degree triggered by national educational policy that equates quality of education with holding a doctoral degree.

There is, however, a positive correlation, and not a small one, between the level and type of studies pursued and occupational destinations. At the same time, however, there are personal, institutional, social, and economic dysfunctions that quite likely reduce the magnitude of this correlation. As regards the effects and effectiveness of doctoral programs in education, greater knowledge of the destiny of doctors in education acquired by means of high quality research, both within and outside the academic world, is needed. Finally, the impact of doctorally-prepared individuals on education as well on larger society should be a large part of the consideration of the future of doctoral programs in education in specific countries and in specific contexts.

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