SILA SAGUN

STUDENTS' PERFORMANCE, SKILLS AND PERSPECTIVES ON THE COMBINATION OF NATIONAL AND INTERNATIONAL CURRICULA FOR UNIVERSITY EDUCATION IN TURKEY

A DOCTORAL DISSERTATION

BY

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THE PROGRAM OF CURRICULUM AND INSTRUCTION
İHSAN DOĞRAMACI BILKENT UNIVERSITY
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MAY 2016

2016

DEDICATION

This dissertation is dedicated to my husband, Çağlar Sagun, and my parents Vildan and Yaşar Kemal Severim for their support, patience and love. I could not have done this without them.

STUDENTS' PERFORMANCE, SKILLS AND PERSPECTIVES ON THE COMBINATION OF NATIONAL AND INTERNATIONAL CURRICULA FOR UNIVERSITY EDUCATION IN TURKEY

The Graduate School of Education

of

İhsan Doğramacı Bilkent University

by

Sıla Sagun

In Partial Fulfilment of the Requirements for the Degree of

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BILKENT UNIVERSITY

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May 2016

I certify that I have read this doctoral dissertation and have found that it is fully adequate, in scope and in quality, as a dissertation for the degree of Doctor of Philosophy in Curriculum and Instruction.

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Prof. Dr. Margaret K. Sands (Supervisor) Dr. Armağan Ateşkan (2nd Supervisor)

I certify that I have read this doctoral dissertation and have found that it is fully adequate, in scope and in quality, as a dissertation for the degree of Doctor of Philosophy in Curriculum and Instruction.

Prof. Dr. Alipaşa Ayas (Examining Committee Member)

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Approval of the Graduate School of Education

Prof. Dr. Margaret K. Sands (Director)

ABSTRACT

STUDENTS' PERFORMANCE, SKILLS AND PERSPECTIVES ON THE COMBINATION OF NATIONAL AND INTERNATIONAL CURRICULA FOR UNIVERSITY EDUCATION IN TURKEY

Sıla Sagun

Ph. D., Program of Curriculum and Instruction

Supervisor: Prof. Dr. Margaret K. Sands

May 2016

This study explores the university preparedness of students who were educated through an international high school education program in Turkey. Within a theoretical framework, which discusses the complexity of the combination of different curricula, the effect of the implementation of an international program in a national program on student outcomes is also investigated. The study compares the academic performance and skills of students who followed the national program (NP) with students who followed both the national program and the International Baccalaureate Diploma Programme (DP).

A mixed method research with convergent parallel design was selected to examine the perceptions of students and faculty members, as well as the quantitative data on students' numerical scores. The quantitative data including university *c*GPAs, individual university course grades, university entrance exam scores, four-year graduation rates and international high school program diploma scores were analysed statistically to explore the difference between NP and DP students. The quantitative data on skills were collected by an online questionnaire and critical thinking skills tests. The qualitative data, collected through focus group discussions and individual interviews with students and faculty members, revealed the differences between the two groups of students.

In total, the numerical scores of 761 students from four universities in Turkey were used. 72 students participated in the study for qualitative data collection. Five faculty members from various departments were interviewed individually. The results showed that the DP students had higher university *c*GPAs and higher individual course grades at university. They also had a higher graduation rate after four years at university, it was nearly three times that of the NP group. Focus group discussions and individual interviews further clarified the differences between the academic performance and skills of each group. Overall, the study found that the international high school education program seemed to develop a better student profile for university life.

Key words: International education; International Baccalaureate Diploma Programme; Academic performance; Critical thinking skills; Time management skills

ÖZET

TÜRKİYE'DE ÜNİVERSİTE EĞİTİMİ İÇİN ULUSAL VE ULUSLARARASI MÜFREDATIN KOMBİNASYONU ÜZERİNE ÖĞRENCİ BAŞARILARI, BECERİLERİ VE BAKIŞ AÇILARI

Sıla Sagun

Doktora, Eğitim Programları ve Öğretim

Tez Yöneticisi: Prof. Dr. Margaret K. Sands

Mayıs 2016

Bu çalışmada, Türkiye'de uluslararası bir lise eğitim programı aracılığıyla eğitim görmüş öğrencilerin üniversite eğitimindeki başarıları araştırılmıştır. Farklı müfredatların kombinasyonunun karmaşıklığını tartışan teorik bir çerçeve içinde, ulusal bir programda uluslararası bir programın uygulanmasının öğrenci sonuçları üzerine etkisi de araştırılmıştır. Çalışma, ulusal programı (NP) takip eden öğrencilerle hem ulusal program hem de Uluslararası Bakalorya Diploma Programı'nı (DP) takip eden öğrencilerin akademik başarıları ve becerilerini karşılaştırır.

Yakınsak paralel tasarım ile karma yöntem, öğrenci ve öğretim üyelerinin algılarının yanı sıra öğrencilerin sayısal puanları üzerindeki nicel verileri incelemek için seçildi. Üniversite genel not ortalaması, üniversitede bazı derslerdeki notları, üniversite giriş sınavı puanları, dört yıllık mezuniyet oranları ve uluslararası lise programı diploma puanları dahil olmak üzere nicel veriler NP ve DP öğrencileri arasındaki farkı bulmak için istatistiksel olarak analiz edildi. Beceriler üzerine nicel veriler, elektronik bir anket ve eleştirel düşünme becerileri testleri ile toplanmıştır. Odak grup tartışmaları ve öğrenciler ve öğretim üyeleri ile bireysel mülakatlar yoluyla toplanan nitel veriler iki grup öğrenci arasındaki farklılıkları ortaya koymuştur.

Toplamda, Türkiye'de dört üniversiteden 761 öğrencinin sayısal puanları kullanıldı. Nitel veri toplanması için 72 öğrenci çalışmaya katıldı. Çeşitli bölümlerden beş öğretim üyesi ile ayrı ayrı mülakatlar yapıldı. Sonuçlar DP öğrencilerinin üniversitede daha yüksek not ortalaması, bazı derslerde daha yüksek notları olduğunu gösterdi. Ayrıca üniversitede dört yıldan sonra daha yüksek mezuniyet oranları vardı, mezuniyet oranları NP grubunun yaklaşık üç katıydı. Odak grup tartışmaları ve bireysel görüşmeler ayrıca her grubun akademik başarıları ve becerileri arasındaki farkları açıkladı. Genel olarak, çalışma uluslararası lise eğitim programının üniversite hayatı için daha iyi bir öğrenci profili geliştirdiğini ortaya koymuştur.

Anahtar Kelimeler: Uluslararası eğitim; Uluslararası Bakalorya Diploma Programı; Akademik performans; Eleştirel düşünme becerileri; Zaman yönetimi becerileri

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Curriculum implementation has played a major role in changing the quality of education and therefore the success of students. Curriculum is the key component of the systems offered by the schools (Fail, 2011). In order to prepare students successfully for the future, educationists continue to establish new curriculum and educational programs, both within national systems and internationally. International educational programs, spanning as they do different cultures, skills and knowledge, can play a meaningful role in helping to develop the skills and success of students. One of the best known high school international programs for increasing students' readiness for higher level studies is the International Baccalaureate Organization (IBO) Diploma Programme.

Since some governments require students to complete their country's national programs, designed by the Ministry of Education, any international program in that country has to be taught parallel with the national. This is the case in Turkey, where students have to study the national and international curricula simultaneously.

This study aims to increase understanding of the effect of plural curricula on student preparedness for university education in Turkey. The combination of the national program and the international program is analysed by exploring the perspectives of students and faculty members, as well as students' numerical scores and graduation rates.

This chapter discusses the background of the study and the problem statement, and gives the purpose, research questions and significance. Terms are also defined.

1.2 Background

Access to an international education has gained importance worldwide (McDonald, 2002; Haywood, 2002). In a globalized world, traditional educational methods are increasingly found to be insufficient to educate well-rounded individuals who can contribute to their community (Hill, 2012; Roberts, 2003). To develop skills such as critical thinking or time management that will benefit students for the future, more and more educators and parents believe that international education is crucial (Cole, Gannon, Ullman, & Rooney, 2014; Walker, 2012). More than just for internationally mobile students, international education is becoming important for any student who would like to acquire 21st century skills (Ramler, 1991; Rawlings, 2000).

The aim of international education was initially to create options for mobile students so that students who passed from one country to the other would not suffer differences in the curriculum. Today, other benefits are seen from international education. It is believed that students improve their academic performance and gain important academic skills through international programs, which are also considered to help students to succeed at university. For this reason, international curricula are rapidly becoming widespread (McDonald, 2002), and might be promoted within the context of national systems.

Richards (2002) suggested that having only one version of international education is neither appropriate nor possible. Although there is a possibility of national systems limiting international programs (Hayden & Thompson, 2000), international programs might be promoted within national schools because of the considerable potential of this combination (Cambridge, 2011; Hayden, 2002; Nisbet, 2014). One can argue that the dynamics of change are an almost central part of the educational processes,

and that the dynamic relationship between national and international programs might lead to innovative educational models.

While there are different programs used in international education, one has been developed by the IBO (Bunnell, 2007; Hayden & Wong, 1997), and is now in use in 156 countries (IBO, 2016a) and 4,335 schools (IBO, 2016b).

1.2.1 International Baccalaureate Organization (IBO)

The IBO was founded in Geneva, Switzerland. It has created a curriculum, initially for internationally mobile students, now widely used in many countries, from grade one through middle school to high school. The mission of the IBO has been more than creating student-centred programs: it is expressed as "to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect" (IBO, 2016c, para.4). Such a mission has led state schools as well as privately run international schools to become part of the organization (IBO, 2016c).

The IBO offers a variety of courses and assessment schemes. The policy makers, curriculum designers, and researchers affiliated with the IBO, develop challenging research-based educational programs for national and international schools throughout the world (IBO, 2016b; Sagun & Corlu, 2014). The IBO programs are grouped under three main curricula: the Primary Years Programme (PYP), the Middle Years Programme (MYP), and the Diploma Programme (DP). PYP is designed for the elementary level. MYP and DP are prepared for middle school and high school levels. Junior and senior high school students study the DP curriculum by choosing courses from six different subject groups. This research study was focused on students who had graduated from the Diploma Programme.

1.2.2 International Baccalaureate Diploma Programme (IB DP)

The IB DP is a two-year international education program for students aged from 16 to 19 years. It aims to prepare students for university and for life, and to help students develop not only academically but also physically, intellectually, emotionally and ethically (IBO, 2016d).

IB DP consists of six subject groups: studies in language and literature (mother tongue), language acquisition (second language), individuals and societies, sciences, mathematics, and the arts. There are also three core components: Theory of Knowledge (TOK), Extended Essay (EE), and Creativity-Activity-Service (CAS). The curriculum overview is shown in Figure 1.

Figure 1. DP curriculum overview (IBO, 2016e)

Students usually choose three (not more than four) subjects at higher level (240 teaching hours per subject), and the three others at standard level (150 hours). Students' work is assessed both internally and externally based on specified criteria (IBO, 2016f).

1.2.3 Ministry of National Education (MoNE) Curriculum, and the International Baccalaureate Diploma Programme (IB DP)

MoNE has a four-year high school national curriculum for students aged 15-19. Its mission is "to educate youth according to their interest, desire, talent, and contribute to produce qualified human power that is a driving force of community development" (MoNE, 2016a). It offers, on average, 15 different courses varying between one to eight periods per week at every grade level, consisting of 14-15 common subjects and one and/or two elective subjects for 9th and 10th grade. In the last two years of high school, 11th and 12th grades, students have 8-9 subjects in common and around 10 elective courses based on their interest (MoNE, 2016b).

All the assessment in the MoNE high school curriculum is internal. Depending on the time allotted to the courses, there are two or three written exams, one of which is common for the grade level. A minimum of one oral examination, class participation, and homework each semester is also taken into consideration in the calculation of grades. There are no final examinations at the conclusion of the four-year program. Each student needs to do an end of year-project of his/her choosing under the supervision of a teacher, and also take part in an extra-curricular activity per year of high school. At the end of the 12th grade, those seeking a university education take the national university entrance exam, the results of which allow students to gain entry to a Turkish university. School graduation scores are also considered for university entrance but to a much lesser extent. Therefore, the format and the questions of the university entrance exam have a large backwash effect on the teaching methods and applied curricula of high schools.

Although there are differences in design, application and assessment between national (NP) and international curricula (DP), both state that they integrate a

constructivist and learner-centered approach. As every school in Turkey, both public and private, is controlled by the Ministry of National Education (MoNE), every high school student taking DP has also to accomplish the requirements of the NP in order to meet the high school graduation requirements and to take the university entrance exam. Since MoNE is directly involved in all schooling, it can sometimes be difficulty when both NP and DP programs are taught simultaneously. For this reason, a considerable amount of effort has been used in order to combine national and international curricula.

1.2.4 The IB DP in Turkey

The Diploma Programme (DP) of the International Baccalaureate Organisation (IBO) is the most common international curriculum used in Turkey. In 2016, there are 38 DP schools in Turkey. The first Turkish school was authorized in 1994 (IBO, 2016g).

In the Turkish DP schools, as stated earlier, students have to meet the requirements for both IBO and MoNE. Since the cognitive demand, philosophy and content of the two programs are different, schools have to adjust in order to accommodate both programs. These adjustments include extra hours of teaching, different teaching methods, and different assessment strategies. In particular, the medium of education in DP is English. Students are assessed internally and externally in English for most DP subject areas. So, in addition to different subject curricula and assessment methods, DP students (and teachers) in Turkey must have a relatively high competence in English. Consequently, a great deal of extra work is necessary for the schools, the teachers, and of course the students. Student stress may affect their

performance in the national university entrance exam, the main requirement for university placement.

To prepare for this highly competitive university entrance exam, many students attend cram courses after school or at weekends. This creates a third load of work on their shoulders: the first being the national program, second, the DP, and third, the cram courses. Nonetheless, and in spite of the challenges of following the two curricula together, the NP and DP, more schools have started to apply for the DP in Turkey, and the number of students who register for DP exam has increased. 494 students were registered in May 2011 and 652 students in May 2012 (OCC, 2016a; OCC, 2016b).

Currently, a DP diploma score does not help university placement in Turkey as it may do in other countries, although Turkish DP schools are working in an informal capacity with some universities to gain promotion for completing DP. There are some benefits to having a DP diploma for students in a few private and non-profit foundation universities: based on their DP scores, students can be awarded scholarships of varying amounts, and/or have a double major, and/or have the ability to transfer from one department to another.

1.3 Problem statement

The problem this study attempts is how the combination of international and national curricula helps Turkish students to improve their academic performance and skills for university education. There are already some studies that compare national and international programs by exploring the views of Turkish students, teachers or administrators, but the number of these studies is limited (Bora, 2010; Çam Aktaş, 2013; Demirer, 2002). To understand the outcomes of the combination of a national

and an international program, the role of the high school on university preparation needs to be investigated. 'University preparation' includes skills such as critical thinking and time management skills, as well as academic performance. A study of how NP and DP at high school affects such preparation is the basis of the research undertaken and reported in this dissertation.

1.4 Purpose

The purpose is to determine the differences between the academic performance and skills of students who have followed the national high school program plus DP and students who have followed only the national program, and relate the differences to their preparedness for university. The quantitative analysis of the study included the statistical analysis of *c*GPAs, individual subject scores, four-year graduation rate, national university entrance exam scores and DP scores. In addition to quantitative results, a questionnaire and a skills test were used to collect the demographics and analyse the statistics relating to the critical thinking and time management skills of the differences in students' skills.

Besides the quantitative analysis of their academic performance and skills, the perceptions of the students of their overall preparedness for university education were compared. The difference in perceptions of faculty members about the students' performance and skills were also analysed. The qualitative study included, focus group discussions and individual interviews.

1.5 Research questions

In this study, the academic performance and skills of students who followed the national high school program (NP) and the DP were compared with those of students who followed only the NP. In addition, students' perceptions of their overall preparedness for university were investigated.

The research questions are listed below:

1. With regard to students who have followed the national curriculum plus the DP, and students who have followed only the national curriculum:
   a) Are there any significant differences between the performance in university education of the two groups in relation to their high school preparation?
   b) Are there any significant differences between the skills in university education of the two groups in relation to their high school preparation?
2. What are the perceptions of students of their overall preparedness for university education? How do the perceptions of students who have followed the national curriculum plus the DP differ from those who have followed the national curriculum only?
3. What are the perceptions of faculty members about student performance and skills? How do the perceptions of faculty members about student performance and skills in their university education differ between students who have followed the national curriculum plus the DP and those who have followed the national curriculum only?

1.6 Significance

This study has the potential to contribute to practice and policy. There is limited research on the implementation of the DP in the Turkish national education system. This study examined the effects of the DP on students' school and university performance and skills within the national program. The results of the study may inform teachers, school administrators, and universities on the effectiveness of the combination of NP and DP.

In comparing the effects of both programs, the study may also provide an alternative approach to teaching the high school curriculum, and help to promote the improvement of student achievement for all learners, leading to a greater understanding of how to teach each program more effectively. It may also provide a better understanding of the perceptions of students and faculty members on the combination of DP and NP and the benefits for university transition.

The policies of the national education system and universities may be impacted through this study, in that it may generate discussion on the educational policies of these institutions. The theoretical framework presented in chapter two discusses complexity theory, which may give another area of significance, in that it may help to engage with questions concerning the issues related to the effectiveness of DP applied within national systems of education.

1.7 Definitions of terms

The following are key concepts and/or terms important to study.

International curriculum/program: International curriculum, which includes school subjects, is what is taught and/or learned in schools (Cambridge, 2011). Keller

(2015) explained the international curriculum as an important component of international schools, he stated that international curriculum should have international understanding in character.

International Baccalaureate Diploma Programme (IB DP): It is a two-year high school programme, which also acts as a preparation of students for higher education. Students aged 16 to 19 choose various courses and they are assessed internally and externally (IBO, 2016f).

Ministry of National Education (MoNE) High School Curriculum: MoNE curriculum is a four-year high school curriculum for students aged 15-19. It offers, on average, fifteen different courses varying between one to eight periods per week at each grade level.

NP students: Students who are studying NP who have graduated from the national high school program only are named as national program (NP) students in this dissertation. NP is not used here to involve all grade levels of MoNE, only those who have completed MoNE high school program.

DP students: Students graduated from both national and international program are named as DP students. Since DP is selected as the sample international program, students who studied DP as well as NP are identified as DP students.

Academic performance: Academic performance is identified by analyzing current university cumulative grade point average (*c*GPA), individual subject course grades and graduation rates. Students with *c*GPA minimum 2.0 out of 4.0 are considered academically successful (Bilkent University, 2016a).

*c*GPA: The term *c*GPA stands for cumulative grade point average. This is the average of all grades a student has received at university. It is calculated by

multiplying the scores gained by credits in subjects. The total sum is divided by the total credits in the program (Bilkent University, 2016b). Information regarding participants' most recent cumulative grade point average was officially supplied by the registrar's office of each university. The *c*GPA score includes grades given for other courses as well as Turkish, English, mathematics, chemistry and physics.

Four-year graduation rate: Most undergraduate programs at universities in Turkey are designed to be completed in four years. However, some students extend their studies to more than four years for various reasons such as changing department, retaking classes or personal reasons. Four-year graduation rate measures the number of students who graduated from the university after four years of study.

Critical thinking skills: Critical thinking enables people to think logically and precisely. People who have critical thinking skills do not accept any information without questioning (Aveyard, Woolliams & Sharp, 2011).

Time management skill: Time management is considered to be an important skill or behavior so as to effectively organize tasks and prioritize events (Hellsten, 2012). The time management model developed by Britton and Glynn (1989) lists seven components of time management; (1) choosing goals and sub-goals, (2) prioritizing goals, (3) generating tasks and sub-tasks, (4) prioritizing tasks, (5) listing tasks on a to-do-list, (6) scheduling tasks and (7) carrying out tasks.

Program/programme: The word programme is used when referring to the IB primary years, middle years and diploma programmes, as this is how they spell it.

1.8 Summary

The first chapter has provided the background of the study and the problem statement. The purpose, the research questions and the significance were described. The key terms were defined.

Chapter two, review of related literature, consists of seven sections: 1) introduction, 2) international education/international curriculum, 3) overview of the international baccalaureate diploma programme (DP) including curriculum ideologies and comparison of DP with other international programs, 4) the effect of an international curriculum in high school education on university education, including stakeholders' perspectives, 5) implementing the international curriculum in a national education system, 6) theoretical framework: complexity theory, and 8) conclusion.

Chapter three, the methodology of the study, consists of eight sections: 1) introduction, 2) research design, 3) context for the study, 4) participants, 5) instrumentation, 6) method of data collection, 7) method of data analysis, and 8) conclusion.

Chapter four, the results of the study, consists of three sections: 1) introduction, 2) overview of the results, including both quantitative and qualitative data, 3) conclusion.

Chapter five, discussion, consists of seven sections: 1) introduction, 2) overview of the study, 3) major findings, 4) implications for practice, 5) implications for further research, 6) limitations, and 7) conclusion.

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

The main purpose of this study was to evaluate student readiness and development for university life in Turkey through their academic performance and skills with an international education. The skills selected were time management and critical thinking skills, which were used to evaluate the difference between student outcomes. Research indicates that study skills such as time management are linked to the academic performance of university students (Proctor, Prevatt, Adams, Reaser & Petscher, 2006). Critical thinking skill is described as an important ability in general education (Halpern, 2001) and is referred to as a 21st century skill (Partnership for 21st Century Learning [P21], 2015). Changes in organizations require changes in educational experience and skills, and employers and educators have indicated the need for better critical thinking skills in academic performance and job outcomes (Koenig, 2011).

This chapter reviews the literature related to students' performance and skills through international education. It consists of seven sections. The first covers the objectives of international education and discusses the meaning of international curriculum. The second section gives an overview of International Baccalaureate Diploma Programme and it compares DP with other international programs. The fourth section examines the effect of international programs in higher education and stakeholders' perspectives. The fifth section reviews the literature related to the implementation of international education in national education systems. The final section establishes a theoretical framework, which is the complexity theory.

2.2 International education and international curriculum

2.2.1 International education

UNESCO report (2004) clarified the aims of international education and grouped them into three sections: 1) the development of human personality, human rights and fundamental liberties, 2) international understanding, 3) the promotion of peace. The report defined international education as a process needed to achieve universal values and to foster international understanding.

> These attitudes and aptitudes are clearly seen in the friendly relations between nations, in a mutual understanding for achieving an equitable and enduring progress for all human beings with a tolerant cooperation in solidarity which is based on understanding, knowledge of others and respect towards human rights and universal civil responsibilities. (UNESCO report, 2004, p. 96)

Instead of a general definition of international education, the IBO provides a list of criteria by which to judge international education:

- Developing citizens of the world in relation to culture, language and learning to live together
- Building and reinforcing students' sense of identity and cultural awareness
- Fostering students' recognition and development of universal human values
- Stimulating curiosity and inquiry in order to foster a spirit of discovery and enjoyment of learning
- Equipping students with the skills to learn and acquire knowledge, individually or collaboratively, and to apply these skills and knowledge accordingly across a broad range of areas
- Providing international content while responding to local requirements and interests
- Encouraging diversity and flexibility in teaching methods
- Providing appropriate forms of assessment and international benchmarking. (IBO, 2012, para.1)

In spite of the apparent clarity of the two ways of defining international education quoted above, the most significant problem with the literature on international

education remains how to define it. Sylvester (2007), for example, stated that "Any historical interpretation of international education poses several challenges to the researcher. A lack of consensus on a working definition has complicated research efforts". It is therefore clear that, since there are many activities and disciplines related to international education, there are multiple meanings. In the field of research, 'international affairs, global education, multicultural education, peace education, exchange programs, globalization and intercultural studies' are all included in international education.

Earlier, Sylvester (2002), had investigated the historical standpoint of international schools. He shared the story of the first international school, The Spring Grove School established in England in 1866, to point out the need of international education in terms of international understanding. By 1956, schooling in international education had given rise to discussions on the definition and key aspects of international education (Bibby, 1956).

Later, Gellar (2002) discussed the establishment of the International School of Genova in 1924 (just after World War I) in the history of international education. He argued for international education as the essential element of maintaining world peace. According to Gellar, there are two distinct parts of international education: educational and ethical. The educational part includes the curriculum (the meaning in the curriculum) and the ethical part consists of universal values such as justice, peace and compassion. He listed some common ideas which should be considered under universal values. These are encouraging understanding, empathy and the sharing of goods and ideas.

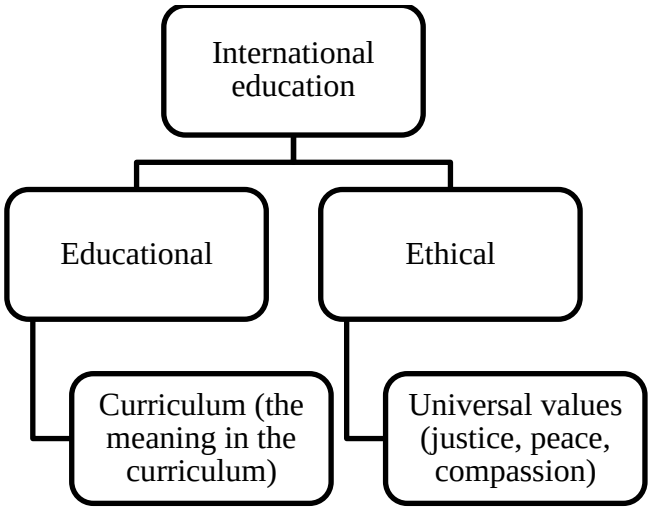

Figure 2. The components of international education, educational and ethical (Gellar, 2002)

Other researchers have described international education from different perspectives. Wylie (2011) pointed out the role of information and communication technologies (ICT) on the nature of international education. He described the impact of technology on politics, the way how people live and globalization. He said that "international education involves communication between students, teachers and curriculum writers in all parts of the developing and developed world" (Wylie, 2011, p.23). He emphasized the constant change and unpredictability in education with rapid developments in technology. He stated:

> Pedagogies are constantly changing as society is continually adopting ICT and adapting to the influence of ICT. Pedagogies are emerging which are becoming global in nature. The ability to locate and obtain vast amounts of information and the free movement of information across national borders is impacting the nature of 'international schooling'. (Wylie, 2011, p.23-24)

Wylie further described social relationships as message systems in education. He identified the parts of these systems: curriculum, pedagogy, evaluation and the transmission of ideology. Since he described "the distribution of knowledge as

currency of globalization", these message systems might have important roles in the control mechanisms of international education.

According to an earlier paper by Wylie (2008), different forms of message systems will contribute different forms of international education. He described a taxonomy called 'International Education Matrix' to make it possible to review the relationship between theory and practice. He explored each practice identified under a theory. Figure 3 lists the components of the practices in Wylie's International Education Matrix. Assessment, pedagogy and curriculum are components of *message systems* in practice. ICT and teachers are considered as components of *mechanisms of learning and control*.

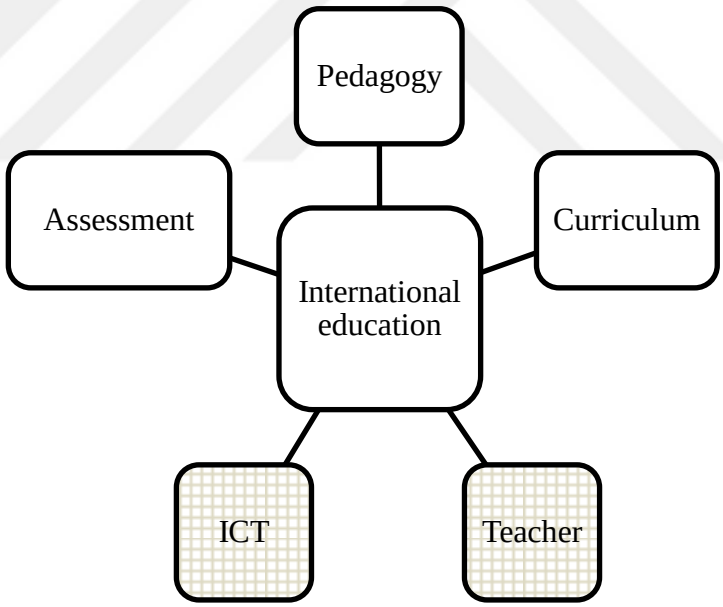

Figure 3. The components of practice in international education (Wylie, 2008)

In his later paper Wylie (2011) explored three schools as examples of international education, based on his personal experiences. His analysis of these three case studies showed him that the strongest common theme in the definition of international

education is a curriculum model. However, he concluded that there is no obvious definition of international education. He stated:

> Even within a single institution, such as in each of the cases explored, no one static definition of 'international education' or ideological location for the activity exists. Rather there is a constant struggle between ideological perspectives among constituents framed by the institutional discourse of international schools, international educational organisations and curriculum authorities. (Wylie, 2011, p.37)

The terminology and the challenge of creating a language of international education was also discussed by Walker (2002). He said that there is already a vocabulary of international education and this vocabulary is needed to turn it into a language. He listed some terms related to this vocabulary.

> The vocabulary of international education - responsible citizenship, compassionate thinking, tolerance, diversity within a shared humanity, cultural understanding – no longer sounds like high-flown idealism but seems, on the contrary, to offer the only practice hope for the future of humankind. (Walker, 2002, p.209)

According to Walker there are two steps to establish this language of international education: 1) "values we must all share to understand each other", 2) "structure to build our values into a balanced educational experience that is appropriate to the challenges of the 21st century" (Walker, 2002, p.212). On the other hand, he stressed there is not just one definition of international education: "The language of international education will therefore acquire a number of different dialects" (Walker, 2002, p.214). He argued:

> No one can impose a template of international education; no one can police a system of international education. But instead, the growing number of organizations in this field can continue to work together to develop and share a language of international education so that others can be encouraged to learn it, to adapt it to their cultural environment, and then speak it back to us. (Walker, 2002, p.215)

This study concentrates on an understanding of international education, mostly in relation to international education in high school education in Turkey.

2.2.2 International curriculum

Some items related to international education are consistent among different researchers. Researchers consistently use the terms “universal values” and “curriculum as part of the practice” when they describe international education. The curriculum offered by the schools is considered as a key component (Fail, 2011), and curriculum design and implementation might change the nature of schools.

Defining “curriculum” is no easier than defining “international curriculum”. The lack of clarity about the definition of international education makes it more complicated to discuss the meaning of the term “international” in international curriculum. Marsh and Willis (2003) noted there is no certain definition of curriculum to accommodate all perspectives. However, their holistic view of curriculum is useful to refer to international curriculum later: they defined the term curriculum as “an interrelated set of plans and experiences” (Marsh & Willis, 2003, p.13).

> An interrelated set of plans and experiences that a student undertakes under the guidance of the school. … This definition acknowledges the complexity of individual interactions while honoring the role of formal education as a collective attempt to enrich individual lives. (Marsh & Willis, 2003, p.13)

If the curriculum is the central element of international education, it should include the universal values (Gellar, 2002; Haywood, 2002). According to Haywood (2002), there is a demand for a curriculum which provides global and local content, and which also supports international vision. This demand or need makes the developments possible (Haywood, 2002).

An international curriculum unites students from different countries and cultures. This is the reason why different instructional methods should be included in the teaching of an international curriculum. It has to be acceptable not only for students and parents, but also for access to higher education. An international curriculum should also be designed around different educational philosophies (Hayden and Wong, 1997) and thus be important in the development of well-rounded students (McKillop-Ostrom, 2000).

Skelton (2002) discusses the term international within international curriculum in four ways:

> First, it is an approach that sets out to develop understanding of our similarities, in addition to acceptance of our differences and an ability to live together within those differences. Second, it is an approach that accepts the need to define the knowledge, skills and understandings that lead to an international mindset as rigorously as it accepts the need to define the learning outcomes for individual curriculum subjects. … Third, it is an approach that is as much about developing a formal curriculum and supportive systemic curriculum and management structures as it is about creating an emotional and cultural awareness and attachment to international-mindedness. Fourth, it is an approach that accepts that the development of the knowledge, skills and understandings contained within the idea of "international mindedness" is necessarily different for children and students of different ages and at different stages of development. (Skelton, 2002, p.53)

Skelton's approach to international curriculum offers a curriculum rooted in international-mindedness for any student. In the same study, Skelton suggests the term "internationally-minded" curriculum instead of international curriculum. He states that the international and the national curriculum have common aims and procedures. So a national curriculum might also be internationally-minded. The idea of an international curriculum does not simply imply mobile students any more, but implies that all students might gain from the universal values of the curriculum.

Students are offered an international curriculum in some schools around the world, the number of which are increasing worldwide (McDonald, 2002; Haywood, 2002). This growth demands a new approach to a curriculum, to become more responsive to the needs of students with different background, as the competencies that an individual may gain from international education are more important than ever in a globalized world (Walker, 2012).

Several researchers have described the schools which apply an international curriculum as unique places of learning and teaching with respect to their student and teacher populations, coming from different cultures to meet and work for a common purpose (Corlu, 2013; Hayden & Thompson, 1998). These schools promote international education through their international curriculum. The international curriculum used by such schools is usually designed by the International Baccalaureate (IBO) organization (Hayden & Wong, 1997). The programs of the IBO are practical, providing students with opportunities to continue their education across the globe (Daniel, n.d.).

Later, Langford, Pearce, Rader and Sears (2002) described IB schools as more student-centred than those following a national curriculum. They portrayed IB schools as organizations where students are encouraged to be responsible for their own learning. The schools encourage inquiry, critical thinking and problem solving skills.

Gellar (2002) pointed out that schools which follow the IB programs had the essential component of international education, international curriculum, since these programs do not study the topics from one perspective only. Additionally, IB programs give continuity with primary years programme (PYP), middle years programme (MYP) and diploma programme (DP) following each other and thus

making an international education experience possible across all ages (Drennen, 2002; Hill 2002).

Hill (2002) stated that the DP fits well the model of international education. He explained that the 'ideological, utilitarian and pedagogical reasons of DP' makes the DP a good model of international education. Finally, Walker (2007) advocated the DP as good preparation for higher education. He pointed out that people are interested in the DP not only because of its international nature but also because of the high quality of the program together with its internationally benchmarked assessment (Walker, 2007).

2.3 Overview of the International Baccalaureate Diploma Programme (DP) including curriculum ideologies and comparison of DP with other international programs

International Baccalaureate (IB) Diploma Programme (DP) has been discussed as an example of world-class education because of the knowledge, skills and attitudes students gain from it (Hill, 2012; Walker, 2007). Since the DP is considered to be a distinctive and high-quality program which improves teaching and learning, it signals to universities that its philosophy and content are appropriate for teaching 21st century skills (IB strategic plan, 2011).

2.3.1 Curriculum ideologies contribution to the DP

Ateşkan, Onur, Sagun, Sands and Çorlu (2015) considered curriculum ideologies contributing to the curricula of both the national program in Turkey (NP) and the DP in order to determine the general framework of both, using the curriculum ideologies described by Schiro (2012). To be able to discern the underlying ideologies of the

two, teachers were asked to differentiate between them. They examined different philosophical emphases on the policy documents and the subject area documents (Turkish, English, biology and mathematics). The examination of documentation indicated goals in line with the social reconstruction ideology such as helping peace-building (DP) and feeling responsibility towards family, country and society and trying to improve themselves (NP). However, analysis by teachers familiar with both the DP and NP in the four curricular areas chosen, (Turkish, English, biology, mathematics) showed that practices that involved social reconstruction ideology were the least obvious in both programs.

Ateşkan et al. (2015) also found that the distribution of the four curriculum ideologies was more balanced in DP than NP. The predominant ideologies in DP are learner-centred and social efficiency, whereas in NP they are scholar-academic and social efficiency. The authors argued it is more positive to have both NP and DP since their curriculum ideologies are complementary of each other. These ideologies are summarized in Figure 4.

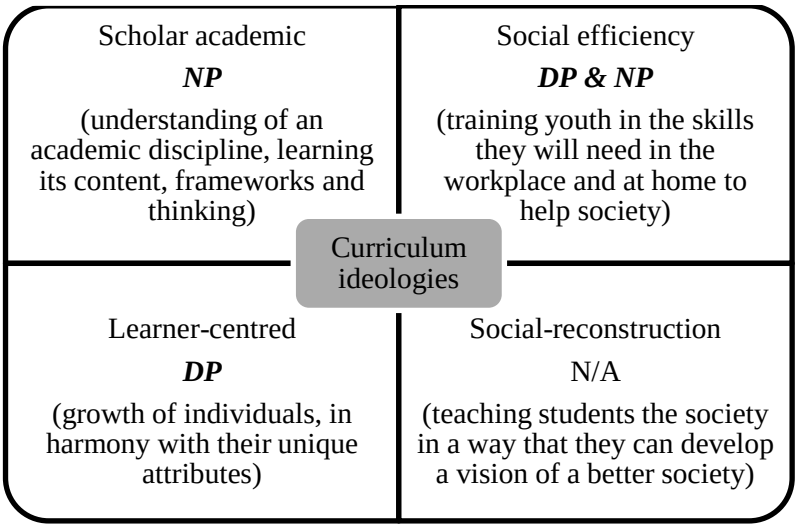

Figure 4. Four curriculum ideologies related to NP and DP (Adapted from Schiro, 2012)

Figure 4 shows that these two programs have different curriculum designs. Overall, we can claim that NP contains the components of subject-centred design (interdisciplinary subjects and scholarly disciplines, procedural knowledge, information processing and thinking); and that DP contains learner-centred design (students' interests, needs and experiences) (Ornstein & Hunkins, 1998). Although the topics are covered in more depth in the NP, the DP gives importance to understanding with student-centred education.

Yılmaz (2005) suggested some approaches for the new biology curriculum designed by the Turkish Ministry of National Education by comparing it with the DP biology curriculum. Yılmaz concludes that DP biology curriculum is more student-centred, whereas the objectives and activities of the new Turkish biology curriculum are more teacher-oriented. Kondakçı (2014) compared national and international English language curricula used in Turkey. She identified different educational philosophies, and concluded that DP language A and language B are learner-centred, Advanced Placement (AP) English literature and composition are scholar academic, and Turkish NP is learner-centred reflecting scholar academic and social efficacy ideologies.

2.3.2 Comparison of the DP with other international programs

The DP has been compared with other educational models in different contexts. For example, Green and Vignoles (2012) compared different qualifications related to students' performances in the United Kingdom. Their study described the equivalence in the system for university acceptance for DP and Advanced Level programs. It was found that universities usually ask for higher scores in DP than Advanced Level. They also analysed students' (DP or Advanced Level students)

acceptance into higher education. They concluded that DP students have higher acceptance rates and perform better than Advanced Level students in higher education. This could be related to subject preference as more DP students prefer to study social studies and history than science, technology, engineering and mathematics subjects as compared with students who have Advanced Level qualification (Green & Vignoles, 2012). Moreover, Frank-Gemmill (2013) found that DP students are more likely to have honours degrees than others in the UK. DP diploma scores are considered as good predictors for university performance. It was also reported that DP students felt more positive about their research skills and university preparation compared to Advanced Level students (Wray, 2013).

In addition, Inkelas, Swan, Pretlow and Jones (2012) compared DP and Advanced Placement (AP) students. They reported the positive effect of the extended essay experience on the research skills of DP students, who indicated that their extended essay experience helped them to have better research skills. According to the researchers, DP students feel they are well prepared for university courses, unlike AP students.

Hertberg-Davis and Callahan (2008) analysed students' views on curriculum, instruction and environments within AP and DP courses. They found that although students feel more prepared for college after taking AP or DP classes, not all students are capable of completing these programs. Furthermore, teachers confirmed that students who have time management problems struggle the most. It could therefore be the better students who completed AP or DP or who were better prepared.

Besides the programs widely accepted such as AP or Advanced Level, certain programs used in different countries are also compared with DP programs. Dixon, Charles, Moss, Hubber and Pitt (2014) outlined the alignment between DP and the

Australian curriculum. They stated that the DP supports the development of critical thinking skills in a better way when compared with the local alternatives.

Also in Australia, Paris (2003) conducted a case study to understand why students choose to do DP instead of the national curriculum. He collected data from both public and private schools. He concluded that the reasons why students choose the DP program relate to many factors: class size (smaller classes), teachers' experience, in-depth curriculum, higher possibility to enter the universities and the perception that DP is for better students. Additionally, some determinants of high schools' advanced course (DP or AP) offerings were identified by Latarola, Conger and Long (2011). The size of the school and the student profile were the main factors that affect the school's decisions to offer advanced courses.

2.3.3 The case of Turkey: IB DP in Turkey

In recent years, the number of DP schools has increased in Turkey, 38 schools in 2016 (IBO, 2016g). To create motivation for the program, the Turkish DP schools, and their informal association, have campaigned with the universities to gain some tangible motivational benefits for completing the DP. Some private and non-profit foundation universities grant DP graduates scholarships of varying percentages according to their DP diploma scores, or allow double major and/or internal transfer rights from one department to another.

Despite the increase in the number of DP schools and the universities preferred by DP students in Turkey, research on the performance, skills and perspectives of DP students has been limited. Several researchers have analysed the DP itself and the competencies of DP students in the Turkish context, carried out on a variety of

research questions, including curriculum alignment, teacher skills, stakeholders' perspectives or textbook analysis (Sağlam, 2012). Within the Turkish context, the DP is overall considered very positively.

Demir (2009) explained that students, teachers, administrators and parents all agree on the positive effect of the DP on the critical thinking skills and oral expression of Turkish students. Additionally, Demir found a significant difference between national program (NP) and DP students' critical thinking skills (Demir, 2009). Another study was carried out by Bayülgen (2012), who also found a significant difference between DP and NP students' critical thinking skills. She compared the cognitive and affective skills of DP and NP students who take DP Turkish A1 course and NP Turkish literature course. Language courses were selected for comparison because it was assumed that it is reasonable to teach critical thinking skills in language courses. Bayülgen concluded that DP students have a higher level in identified skills. She identified these skills as "critical thinking", "creative thinking", "communication", "inquiry", "problem solving", "decision making", "using information technologies", "using Turkish properly, nice and effectively" and "appreciation of art".

The development of students' critical thinking skills has been argued by other researchers (Çam Aktaş, 2013; Çetin & Demiral, 2012). When compared to the national curriculum courses, more activities such as in-class discussions or making comparisons are carried out in DP lessons to promote critical thinking skills. The researchers argued that DP helps more for the development of critical thinking skills but unlike Demir's research, Çam Aktaş found no significant difference between DP and NP students (Çam Aktaş, 2013).

In another study, NP students' language and expression skills were evaluated by using DP Turkish A1 course criteria (Çetin & Demiral, 2012). The results indicated that NP students' language and expression skills are at intermediate level, as student mostly made personal comments without using resources.

Although the evidence cited above indicates that DP has a good effect on students' improvement. there are still questions related to the students' performance, especially on the national university entrance examinations. Since studying both the national and an international curricula is demanding, students who are part of this system might not be successful enough in written exams such as the national university entrance exams. Gültekin (2006) compared students' national university entrance exam scores. Data were collected from one private school in Turkey for all students who graduated between 2003 and 2005: a significant difference was found between the scores of DP students and NP students. DP students had significantly higher diploma and higher scores in national university entrance exam than NP students (Gültekin, 2006). On the other hand, Gültekin argued that students who have better skills might naturally do better in any exam (Gültekin, 2006).

Demir (2009) reports that students believe that the DP supports university life and that there is a good contribution of the DP on university education. The DP prepares students better by helping them to gain organizational skills since they experienced in studying two programs at the same time, both national and international curricula. Although DP and NP do not overlap perfectly and this combination creates a heavy overload on students, the school administration accepts the positive effect of combined curricula on academic performance (Demir, 2009; Kadıoğlu & Erişen, 2016; Yılmaz, 2005). Kadıoğlu and Erişen (2016) also state that students who choose DP have a better education, and also improve their English levels.

Both the students' academic performance and skills, and also their perceptions, have been discussed within the Turkish context (Bora, 2010; Demirer, 2002; Özbilgin, 2005). Although there seemed to be no relationship between the learning environment and the application of DP, the perceptions of DP students and teachers were very positive (Bora, 2010). DP students' attitudes towards individual subjects were also positive, and the flexibility of the program helped them to gain intrinsic motivation (Özbilgin, 2005).

Başer (2007) investigated the effect of learning motivation, reasoning ability and learning orientation on the understanding of mitosis and meiosis topics of both NP and DP students. Different factors on achievement of NP and DP students were identified. Formal reasoning ability had a positive effect on the achievement of both groups. On the other hand, active learning strategies and rote learning were described as having a negative effect on NP students' achievement.

The attitudes of DP students towards science in DP experimental sciences were analysed by Özbilgin (2005). She concluded that the DP makes a meaningful contribution to the classroom environment and to students' positive attitudes. She also found that teachers' perceptions of the effect of the DP on students were positive in terms of the skills identified.

Alternatively, Turkish teachers' perceptions on the effect of DP on their own teaching were explored. Demircioğlu and Çakır (2015) investigated the cultural competence of Turkish DP teachers who teach English. These teachers were asked to answer questions on intercultural language teaching. All agreed that intercultural communicative competence is more important then grammar. Also, DP teachers had high job satisfaction compared to the teachers who teach in NP only, especially teachers who have more than 21 years experience (Demirer, 2002).

Halıcıoğlu (2008) described the application of the DP from a different perspective and emphasized that other aspects needed to be considered for all IB programs in Turkey. When she studied the perceptions of DP staff, she found that 69% of respondents agreed that DP fits well with their schools' aims, but the language barrier limits some Turkish teachers for training. 27% of respondents had never been able to attend the annual IB day in Turkey; and 27% of respondents had never logged on to the Online Curriculum Center, a forum created to support IB teachers. She concluded that teachers in Turkish schools value IB programs, but the international relevance of the program should be questioned because of the language barrier.

Sen (2001) also argued that it is a mistake for schools to apply the DP with reasons such as, "other schools are doing it, passport to universities abroad, furthering someone's career" (Sen, 2001, p.5). He stated that the DP should be appropriate to the school mission, and should be understood and accepted by everyone, staff, students and families.

However, Onur (2008) emphasized that the application of the DP would have a positive influence on teachers. Since there are a good number of professional development opportunities in DP, teachers should be good at technology in order to access quality teaching materials, and the DP would affect the curriculum and educational culture of a school.

2.4 The effect of an international curriculum in high school education on university education, including stakeholders' perspectives

There has been an interest in evaluating how the DP prepares students for university education. A number of approaches, from statistical tests to qualitative studies, to

examining students' performance and skills have been used. The readiness of DP students for life at university has been analysed in different parts of the world.

2.4.1 Students' preparedness for university education

Administrators, teachers and parents show interest in the use of international examinations because of the possible international credentials, as well as other benefits which may be seen as part of the package. It is also important to consider the validity of an examination in predicting the success of students in the next step of their education (Lowe, 2000). It is the aim of the present study to explore students' academic performance and skills in higher education and try to relate them to their high school education.

Gellar (2002) stated that "the original aim of the IBO to produce a universally accepted curriculum for entrance to higher education has been an unqualified success" (Gellar, 2002, p.31). Researchers examined the effect of the DP on university preparedness of DP students (Coca et al., 2012; Cole et al., 2014; Conley, McGaughy, Davis-Molin, Farkas & Fukuda, 2014; Edwards & Underwood, 2012). DP students have strong qualifications for university. They have higher progression rates in a variety of testing as Cole et al. (2014) found when they said that DP students have significantly higher mean scores than other students on "anticipated university outcomes", "academic self-concept" and "Australian Tertiary Admission Rank" scores. DP students also scored higher than other students in US on the University of Oregon mathematics placement tests (Conley et al., 2014). Edwards and Underwood (2012) explored DP students' progression through universities in Australia. They pointed out that the number of DP students applying to the universities selected increased, where they performed well through the early years of

the university. They noted that there was a high correlation between DP diploma score and university success.

In Mexico, DP students often enrol in top ranking universities (Saavedra, Lavore & Flores, 2013). In Chicago, DP students graduated from public schools are 40% more likely to attend a four-year university (Coca et al., 2012). Bergeron (2015) indicated that 78% of DP students enrolled in higher education immediately after high school in the US, which was above the US average of 69%. In Canada, Varghese, Bluhm and Arida (2010) investigated a method of assessing DP students for undergraduate admission (based on first year performance at the University of British Columbia). They concluded that a DP student with an approximate score of 29 is expected to perform at the same level as a non-DP student who works harder.

With regard to the skills learned during the DP, Goodlad (2006) said that the schools have to focus on complex skills like critical thinking skills. Critical thinking is defined by Scriven and Paul (2008):

> Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness. (Scriven & Paul, 2008, para.3)

Several studies have been carried out emphasizing critical thinking skills gained through participation in the DP. These studies revealed possible gains in the use of critical thinking skills (Cole et al., 2014; Conley et al., 2014; Hood, 2012). Hood (2012) studied DP schools in Oklahoma, US. She found evidence that DP students were well-rounded. They were analytical and they had good study skills. Belal

(2015) investigated the outcomes related to DP participation at a school in Egypt, where DP students developed writing and research skills and gained a broader worldview.

A number of skills helpful for higher education were gained through DP participation. Inkelas, Swan, Pretlow and Jones (2012) studied DP students' research skills at the University of Virginia in the US. They found that DP students continue to research at university, and believe that research skills are important to their future success.

With regard to academic preparation for, and performance at, university, Blaney (2000) stated that international schools are good for academic preparation. Others have stated that DP is a demanding university preparation program (Langford et al., 2002). Shah, Dean and Chen (2010) identified the DP performance as the best predictor of university performance saying that it gave around 25% of the variance.

More research is published regarding the performance of DP students at university, including GPAs and graduation rates. An IB research team (2007) found that DP students usually have higher course grades and higher GPA at university. Although DP students overall earned higher GPAs in the University of California system (Shah et al., 2010), some research findings showed no differences between DP students and their peers' GPAs (Conley et al., 2014; Edwards & Underwood, 2012). Inkelas et al. (2012) found a statistically significant relationship between the DP extended essay score and the GPAs of the first and final university semester. DP students' four-year graduation rates (79%) are higher than national average (39%) (Bergeron, 2015). DP students are more likely to graduate (Edwards & Underwood, 2012; Shah et al., 2010). An IB research team (2007) also interpreted drop-out rates between DP and NP students and found no significant difference, although transition to another

university to continue their higher education or personal reasons were given as the reasons for DP students' drop-out.

2.4.2 The perceptions of stakeholders on the preparedness for university education

The perceptions of DP students on their preparedness for university education are positive. Various studies have discussed that these students have positive feelings on their overall development (IB research team, 2007; Tarc & Beatty, 2012; Taylor & Porath, 2006).

It seems, then, that DP students' experiences during their high school DP years taught them the specific skills and behaviours needed at university. They had better critical and time management skills at the end of the program. DP had taught them how to balance school work and manage time (Coca et al., 2012; Conley et al., 2014; Culross & Tarver, 2007; Taylor & Porath, 2006). In common, DP students stated that they appreciate the learning skills and higher order thinking skills gained through their DP studies (Conley et al., 2014).

DP students believe that they were exposed to a rich curriculum (Taylor & Porath, 2006). Most students, teachers and administrators commented on the rigorous and unique curriculum of the DP (Saavedra et al., 2013). DP students also claimed they had more opportunities because of the curriculum and were prepared well for university education. They were satisfied from their high school experience (Taylor & Porath, 2006; Smith, 2009). They were prepared to succeed and excel in their coursework (Coca et al., 2012).

In Mexico, Saavedra et al. (2013) found that the DP had a positive effect on students for higher education: Mexican DP students consider higher level DP courses as a good preparation for university courses. In the US, Duevel (1999) explored DP students' perceptions on the effect of DP on university education. Participants were DP graduates from public schools offering the DP and from international schools. Duevel found that students perceive the DP as a challenging program and good for university preparation. In China, Lee at al. (2013) explored university choices and university preparedness of DP students: US, UK and Canada were identified as the most popular destinations. They found that teachers and administrators believe strongly that the DP prepares students for a university education in terms of curricular content, study skills and ability to handle intensive workload. DP scores were predictive of both the rankings of the universities where DP students studied and their university GPA with medium level effect size.

Moreover, Conley et al. (2014) reported that DP students have a deeper understanding of the structure of knowledge, concepts and how content connects across disciplines than non-DP students. They also possess a more positive world-minded attitude, and are open to education and interested in other cultures and places (van Dis, 2014).

Some researchers analysed other stakeholders' perceptions, including teachers and faculty members, on the effect of DP on students' preparedness for university education. Keller (2015) stated that stakeholders value international education highly. According to Dixon et al. (2014) teachers believe that DP is more rigorous and provides better preparation for university education. Especially higher level subjects in the DP exceed the achievement standard (Dixon et al., 2014). Coates, Rasicka and MacMahon-Ball (2007) conducted a survey with senior and academic

staff at Australian and New Zealand universities. They found that participants working in an administrative role had more contact with DP students, and university staff were supportive about the program. They stated that the DP is a valuable program with a range of assessment strategies and students have experience of an in-depth curriculum.

However, there are some critics on the application and the effect of DP. Some DP students argued the negative aspects of the program such as "workload stress" and "elitist" (Coates et al., 2007; Duevel, 1999). Coates et al. (2007) commented negatively on some other aspects of the program, "no specific advantage over alternative preparation for university study", "students can experience adjustment problems", "problems with the delivery of program at school" and "conversion of DP scores". In addition, Paris (2003) pointed out that some students do not choose to study DP because of the cost of the program.

Clearly, the bulk of the research shows that there is consensus among students and teachers that the DP prepares students well for university studies, and that DP students have better academic skills which will be helpful in higher education. However, some researchers have argued that some negative aspects of the program should be reconsidered for further development.

2.5 Implementing the international curriculum in a national education system

The idea of an international curriculum does not simply imply mobile students anymore, but suggests that all students might gain universal values and academic skills. This idea of international curriculum is now worldwide and implies a new

approach to the curriculum which is more responsive to the needs of students with different backgrounds. The renovation of the curriculum is necessary.

Walker (2000) stated "there is a misconception that international education was created for the internationally mobile students" (Walker, 2000, p.193). He thinks the relationship between international and national education systems is important, and explains his reasons in three main points:

> First, because the simple logic of numbers tells us that if we want to change the world it will have to be done through state education. Second because, before we get very far, we have to ask ourselves whether the very concept of a global education does not contain a contradiction in terms. And third, because there is clearly growing interest amongst governments in the possibility of building bridges between their national education systems and IBO. (Walker, 2000, p.194-195)

2.5.1 Combination of international and national curricula around the world

The reviewed literature on the combination of international and national curricula suggests four themes. The themes are: government partnerships/IBO related policies; opportunities such as resources and professional development; benefits of schools/change in school culture and limitations.

The IBO has reported partnerships between the IBO and governments in Canada, the USA and Ecuador as well as projects carried out with a variety of countries. IBO-related policies were summarized under general categories such as the recognition of DP courses and inclusion of DP data into school reports (IBO, 2016h).

Implementation of the DP in Ecuador's public schools was researched by Barnett (2013). The Ministry of Education has supported public schools in the implementation of DP in different parts of the country, starting from 2006. The researchers summarized the changes that took place in schools with DP. They reported positive changes in pedagogy, school design and culture. DP students were

more organized and better in thinking in a sophisticated way. These students were more self-confident and they expressed themselves well. DP teachers in public schools also commented positively on DP interaction in their schools. Most reported they have better teaching and learning practices. The school structure and culture was also improved with better technology usage, more professional development opportunities and more responsible students.

In Mexico, Saavedra et al. (2013) believe that the DP might affect the traditional school curriculum positively, and stated that the DP is a missed opportunity for Mexican public schools. DP could be an opportunity for the Mexican national government and they suggested to invest in the program and use it as a model to improve the secondary education system.

In the US, the DP's greatest use is in the USA in public schools rather than private schools. The public schools are not especially interested in its international nature but are attracted to a high quality program. There are other examples of international programs promoted in national schools. For instance, the British International General Certificate of Secondary Education (IGCSE) is used in different educational contexts from international schools to national schools. It has even been used to form the basis of national examinations (Beedle, Eason & Maughan, 2007).

Other researchers explored the alignment of DP with the standards, principles and practices in the national/local curriculum. Faas and Friesehahn (2014a, 2014b) explored similarities and differences between the DP and standards and curricula from selected regions of Germany and Switzerland. This study indicated a high level of content alignment in natural science (biology and mathematics) and less alignment in the social sciences and humanities (history and Spanish).

In Australia, Dixon et al. (2014) explored how the DP aligns with the standards outlined in the Australian curriculum. They argued that the national focus of the Australian curriculum contrasts with the DP's global focus. With a few exceptions, the DP curriculum generally provided greater depth than local alternatives, while also supporting the development of critical knowledge and skills.

The implementation of an international curriculum in a national education system might have some limitations. Doherty and Shield (2012) stated that the DP alongside the local curriculum in Australian schools impacted on teachers' work. Some teachers were affected positively but not all of them. For instance, experienced teachers might find the implementation of a new curriculum rewarding, but an additional program might be challenging for new teachers. Tarc and Beatty (2012) stated that a limited course offering is a common challenge for most schools implementing an international curriculum in public schools in Ontario, Canada.

Taking a very different focus, Doherty (2009) researched sample schools on the implementation of DP in public schools in Australia. She also looked at how students use the DP and NP to increase their chances to be placed at university (Doherty, 2012). She concluded the schools offer the DP together with local curriculum in order to retain good students: DP is used as an advantageous strategy for competition.

2.5.2 The case of Turkey: implementing the international curriculum in the Turkish national system

International and national programs have been designed for different clientele, as indicated by the words *international* and *national*. However, the swift globalization

of our times has forced both to change and take other needs into consideration. The DP, specifically designed for international schools in the second half of the 20th century, is now (2016) being used by 156 countries and 4335 schools (55% of them are national schools) (IBO, 2016a; IBO, 2016b). IBO states, "The Diploma Program prepares students for effective participation in a rapidly evolving and increasingly global society" (IBO, 2016i). The Turkish NP, on the other hand, designed for the children of a new nation state early in the 20th century, has also developed and evolved, showing awareness of the same global interdependence in its mission statement, "constructing a happy society partner of contemporary civilization" (MoNE, 1973).

Onur (2008) explained the design of a school-based syllabus by implementing the DP into the NP in a Turkish school, where the departments studied the overlaps between NP and DP for the academic curriculum. Teachers identified differences in method but not content. Onur (2008) suggested a circular hexagon or "hexacircle" for the combination of DP and NP, a combination which would be possible with "resources, teacher training, professional development, selectivity in student enrolment and good teachers". Also, new assessment strategies were adopted with DP implementation at school. For instance, mock DP exams were given to both DP and NP students and the scores were calculated for students' report cards. Çamlıkaya (2007) also argued that a national curriculum can be covered by the IB Primary Years Program (PYP) to improve the quality of education by co-curricular planning.

Although a national program has advantages such as a uniform system equality, or continuity, a single approach adopted could reduce opportunities. Some researchers have discussed the benefits of other programs in addition to the national program. For instance, Sen (2001) summarized some benefits of the DP on students in Turkey.

He considered the DP to be a program which prepared students well academically for university life as DP students understand the benefits of their high school education when they are actually studying at university. He also referred to the fact that the DP as a program might change the culture of the schools, as DP students end up as knowledgeable, reflective and self-confident. He therefore suggested "nationalizing the Diploma Programme" because of the benefits he observed. He predicted that the number of students who access the DP will increase with the careful adoption of the DP within the national program.

Meanwhile, Halıcıoğlu (2008) has raised concerns regarding the implementation of the international curriculum within Turkish schools. In brief, she stated that Turkish schools use the DP curriculum alone to provide an international education, but there is no multicultural environment. According to Halıcıoğlu (2008), there is a need for discussion on the international aspect of the DP since almost all students and most of the teachers are Turkish.

Also, Belal (2015) stated that the outcomes of applying the DP at a school are dependent on how the DP is implemented at each school because of the teachers' interpretations, the integration of DP philosophy and students' choices.

In summary, DP interaction in public schools is generally seen as positive and DP implementation as an opportunity for the improvement of school structure and culture. But concerns have been raised, and some possible limitations to the combination of national and international curricula identified.

2.6 Theoretical framework

Schools are complex systems (Morrison, 2005). The school community including students, teachers, parents and administrators (sometimes they are both teachers and parents or both teachers and administrators) is only one level of this complex system with many interactions. The other levels of this system might include the activities selected, the programs developed and the curriculum applied. Of course, there are always new demands in education. The schools have to change internal conditions to meet the external needs of a globalized country or world. These complex systems have to change, develop, evolve for their survival.

Today, globalization affects many countries by reshaping the global economy (Rizvi & Lingard, 2000). Even school contexts are affected by globalization, and change in school contexts might affect everyone in the community from students to school leaders. Rizvi and Lingard (2000) said that globalization raises many complex questions in educational studies since there is no clear distinctions between local and global.

The study described in this dissertation discusses the outcomes of the combination of national and international curricula, NP and DP, as a complex system. The schools in Turkey which would like to apply the DP have to implement the program in the national education system. The application of the DP might differ according to the student profile, the administration and other factors. This is an example of multi-perspective or multi-level complex curriculum system. Implementing the DP within the NP offers new interactions, opportunities and unknowns, which might help education systems to improve. The emergence of a new system through the combination of DP and NP might influence students' performance and skills. The DP within the NP will be discussed within the complexity paradigm since these two

curricula constitute the parts of the new whole. Considering multiple possible interactions of a complex and developing situation, the theoretical framework for this study was provided by complexity theory, explained below.

2.6.1 What is complexity theory?

Complexity theory is not easy to define. Several researchers have explained the meaning and described the components of complexity theory from their perspectives and according to the needs of their research areas. Fong (2006) described it thus:

> Complexity theory involves the intersection of several theories of information, systemic approaches, auto-organization and chaos. There is complexity in interactions, interrelationships between distinguishable elements whose total system forms a relatively coherent dynamic totality. (Fong, 2006, p.10)

This phenomenon points to a sort of system which has layers. The elements which form the system cannot be separated. They interact continuously and this continuous interaction creates a dynamic nature. The continuous interactions between inseparable elements make the system difficult to model (Heylighen, 1996). Complex systems are composed of simpler parts, and these simple parts emerge into a complex order and diversity. The complex order is adaptive to the changes (Kauffman, 1995; Waldrop, 1992). Doll (2008) described the nature of complexity by two concepts, fractals and self-organization:

> One of the most unusual, and most characteristic, features of complex organization is the ability of the complex to develop states of higher (that is more comprehensive) order, differentiation and organization; indeed to create newness from itself via its interactions. (Doll, 2008, p.198)

According to Morrison (2006), the parts of a system interact continuously to produce new relations or new systems. Self-organization operates effectively in open systems where adaptation, feedback and communication are possible. Emergence and self-organization are partners. Emergent systems could not have been predicted in advance. They are non-linear.

Since complexity theory is still developing or changing, tidy/certain descriptions were not identified (Davis & Sumara, 2008):

> Indeed, many complexivists have argued that a definition is impossible. Complexity thinking might be positioned somewhere between a belief in a fixed and fully knowable universe and a fear that meaning and reality are so dynamic that attempts to explicate are little more than self-delusions. In fact, complexity thinking commits to neither of these extremes, but listens to both. Complexity thinking recognizes that many phenomena are inherently stable, but also acknowledges that such stability is in some ways illusory, arising in the differences of evolutionary pace between human thought and the subjects/objects of human thought. (Davis & Sumara, 2008, p.35)

Although it is difficult to identify a definition of complexity theory which will be accepted universally, there are recurrent themes related to the theory in literature. These are the components of the complexity theory, which were listed by Cohen, Manion and Morrison (2006) as shown in Figure 5.

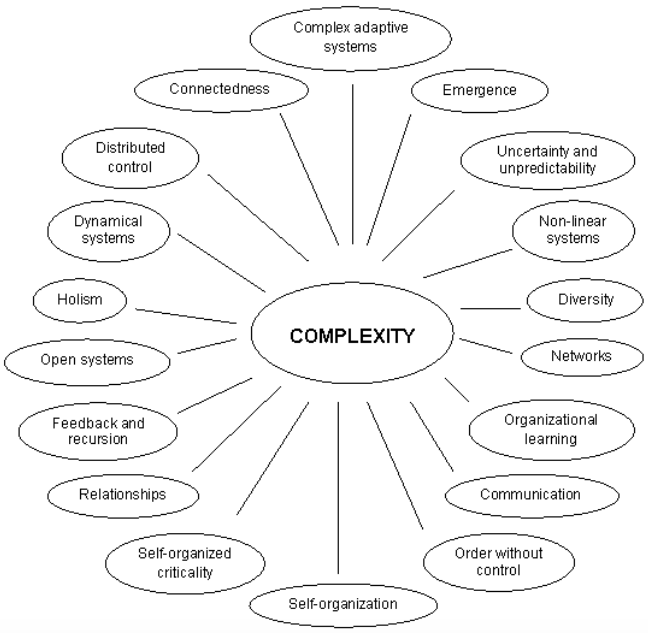

Figure 5. Components of complexity theory (Cohen et al., 2006, para.4)

Jörg (2011) stated that this new approach involves the acceptance of the unknown, the unexpected and the unforeseeable. When the systems are complex, open and far-from equilibrium, they may creatively develop new systems.

Newton's deterministic view, having a sort of pattern, has been challenged with the rise of chaos and complexity theories (Cohen et al., 2006). This is where the theory comes from, the idea of science. At this point some researchers have started to identify the characteristics of complexity in scientific studies. Davis and Sumara (2006) shared their understanding of the evolution of complexity science by giving examples from quantum physics and living organisms. They argued that each phenomenon within complexity theory emphasized two characteristics, a system learns and a system emerges.

Alhadeff-Jones (2008) summarized the history of the development of complexity theory by starting with the etymological roots of the word complexity, "opposite of

simplicity". He described the progress of complexity theory in three generations. The first generation includes examples of *information and communication theories* (conversion of information by electronic devices and neural networks) and *cybernetics* (adaptation of a system to its environment by using feedback mechanisms).

The second generation includes examples of *computer science and engineering sciences* (controlling broad systems such as telephone network), *management science and artificial intelligence*, *fractal theories* (fractals in geometry) and *evolutionary biology*. The third generation includes examples of *complex adaptive systems*. Murray Gell-Mann, Nobel Laureate and Distinguished fellow at Santa Fe Institute, explained complex adaptive systems as follows (Gell-Mann, 1994):

> A complex adaptive system gathers information about its surroundings and about itself and its own behavior, at a certain level of coarse graining. The time series that represents this information can sometimes be approximated by a steady one, although in general it is changing with time, frequently in ways that depend on the system's behavior, and the surrounding are often coevolving. (Gell-Mann, 1994, p.18)

Davis and Sumara (2008) stated that educationists might use the qualities of complexity theory in a variety of studies, including understanding school structures, school community experiences and developments of learning/teaching activities. For this reason, they suggest the complexity theory for educational research. The next sub-section of this chapter reviews the studies on complexity theory in educational research and outlines the importance of the theory for this study.

2.6.2 Complexity theory in educational research

Educational research is a way of thinking about educational changes (Morrison, 2012). It investigates information on education to understand it better (Opie, 2004). Davis and Sumara (2008) stated that complexity theory might be used as a proper educational theory because of the emergent character of educational research. They also developed a working definition of complexity research, "complexity research is the study of learning systems" (Davis & Sumara, 2010, p.856).

While there does not seem to be a large body of research on complexity theory in education, there are some researchers who have studied different educational concepts within the complexity theory. Fong (2006) analysed a curriculum management system through the lens of complexity theory. He suggested that a flexible curriculum is an ideal strategy to cope with multi-level changes at schools. Morrison (2003) examined the curriculum reform documents in Hong Kong and suggested a shift in complexity thinking.

Jess, Atencio and Thorburn (2011) described the complexity theory principles, self-emergence and connectivity, to inform developmental work in Scottish physical education, giving a discussion on complex learning systems from the structure and the delivery of the program.

Complexity theory has a nonlinear framework. The theory suggests an open, far-from equilibrium system as the source of creativity (Doll, 2008). So, it is healthy to remain dynamic. This view might inform the development of new curriculum designs. Morrison (2003) stated that it would be useful to examine curriculum developments. Again, Fong (2006) argued it would be useful for thinking about curricula within the complexity paradigm. He described the curriculum as a complex phenomenon:

> There is a trend in curriculum change, shifting from school level to local/system level, and national and international/global levels; this is combined with an exact reversal of direction in some cases, the movement being for curricula to be determined at the school level. (Fong, 2006, p.2)

The components of complexity are crucial to curriculum development because young people live in a complex society with continuous changes. According to Morrison (2003), ever-changing curricula and a turbulent environment are the order of the day, a linear, mechanistic model no longer applies. This is the reason why he suggested a change from a single curriculum to plural curricula.

There has been separate research on the effect of international curriculum and national curriculum. It would be of interest to know the outcomes of the combination of international and national curricula. In Turkey, Onur (2008) described the creation of a new curriculum at Koç School, the first Turkish DP school. She explained that the process followed the implementation of the international curriculum. She found that the transferability of teacher skills between NP and DP led to benefits for students of both groups. On the other hand, Halıcıoğlu (2008) argued that this emergent program might lose some important values such as internationalism during the implementation process. Harris (2012) also stated that it is difficult to combine the programs without collaboration between national and international systems, which will affect the delivery of this new combined program. Later in the same study he suggests using the TOK course as a starting point for this combination since the course is flexible enough for necessary changes.

For effective combination, the systems need to reach their tipping points; a disequilibrium is needed (Morrison, 2005). When the tipping point is reached, a system that can adapt to the new demands will survive, and ones which cannot adapt

will die out. Eventually new systems will emerge from the old ones (as is explained in Darwin's theory of evolution for living organisms).

The complexity theory is a useful approach to analyse the combination of NP and DP because it can be discussed through different perspectives. It might offer insights for the implementation of the DP within NP. Figure 6 is a representation of where complexity theory can be used to understand the combination of NP and DP, and the emergence of a new system.

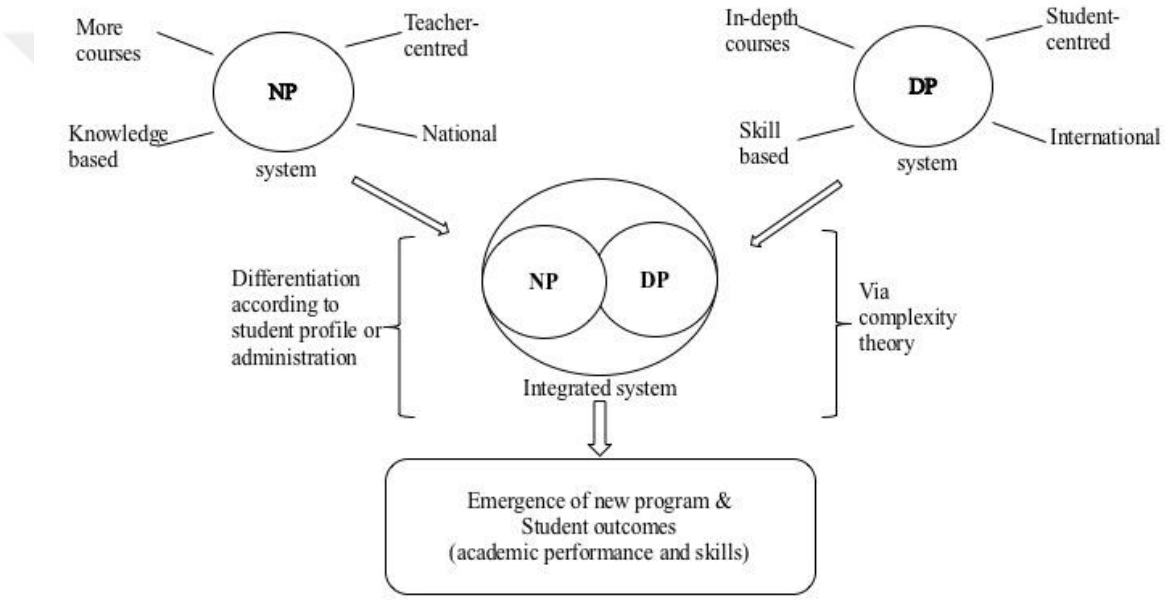

Figure 6. The emergent interaction between NP and DP within the complexity paradigm

In Figure 6, NP and DP are separate elements and the outcomes of their relationship might be examined by complexity theory. NP and DP emerge and give rise to a new system. This new system will influence students' performance and skills either positively or negatively. If students study NP and DP separately, with no connections or transformations, the system may not promote change or it can even inhibit other possibilities (Morrison, 2006). For instance, the combination of NP and DP with a

heavy workload on students might inhibit some other options in their lives. So complexity theory could add value to our understanding of curriculum changes.

2.7 Conclusion

This chapter reviewed the studies on international education and international curriculum. The definitions of international education were examined. *Universal values* and *curriculum* were identified as common themes in research in international education. And the curriculum offered by the schools is considered as a key component (Fail, 2011).

Previous studies which compared the International Baccalaureate Diploma Programme (DP) and other international programs were analysed, since DP is the most common international curriculum in high school education. Researches which evaluated the DP in the Turkish context were studied. The DP within the Turkish context is overall considered positive.

This study aimed to add to the available literature on student preparedness through the combination of national and international curricula. This contribution investigated the similarities and differences between students graduated from national and international programs. Related studies on the effect of international education on students' performance at university were reviewed. In addition, stakeholders' perspectives were included. DP students' experiences in the DP taught them specific skills and behaviours needed at university. They had better critical and time management skills at the end of the program.

The outcomes of the new school curriculum which has emerged by the combination of two curricula, DP and national program, is discussed as part of complexity theory.

Some basic characteristics of complexity theory were explained, by giving examples from educational research and other fields. The review of related literature will be helpful to answer the research questions of this study.

CHAPTER 3: METHOD

3.1 Introduction

This chapter discusses the research design, the context for the study, participants, and instrumentation, the method of data collection and method of data analysis, both quantitative and qualitative. The mixed-method study is used to answer the research questions; primarily the effect of the combination of the national and international programs on students' preparedness for university. The context for the study is outlined to explain the framework of the study and the selection process of participants clearly.

3.2 Research design

This study aims to determine students' academic performance, skills and perspectives on the combination between national and international curricula for university education in Turkey. In order to find answers to the research questions, mixed method research is selected as the research design. This style of research uses the procedures of both quantitative and qualitative studies within a single research project (Denscombe, 2010). A mixed method research is selected because a detailed research is aimed for using different approaches to confirm the data accuracy. The weaknesses of qualitative and quantitative approaches are minimized and the strength of the information collection is improved through a mixed method research design (Ayiro, 2012).

This study investigates the combination of the International Baccalaureate (IB) Diploma Programme (DP) and the Ministry of National Education (MoNE)

secondary school curriculum on students' academic performance, skills and perspectives. The quantitative study is used to compare DP students and national program (NP) students' national university entrance exam scores in terms of their academic performance. The DP diploma scores, university cumulative grade point averages, individual subject course grades, and four-year graduation rates of students are used to compare these two groups. In addition, their time management skills and critical thinking skills are measured quantitatively: students' time management skills by a questionnaire, and critical thinking skills by a test (conducted to see if there is a significant difference between their performances).

The qualitative study explores students' perceptions about their academic performance and skills through focus group discussions and individual interviews. Qualitative data collection begins with focus group discussions, then themes generated in focus groups are used in individual interviews to improve validity (Creswell, 1994; Mishler, 1986; Morgan, 1996). Faculty members are interviewed individually to understand their perceptions about students' academic performance, time management skills and critical thinking skills. Individual interviews with faculty members are used to explore their views on the similarities and differences of NP and DP students in relation to their academic performance and skills.

Gorard and Taylor (2004) stated that a mixed method research integrates qualitative and quantitative data to enhance the triangulation, and enables relative comparisons of participants' understanding and measured scores. In this research, measured scores and the various ideas of participants determine the phenomena holistically.

This study is a mixed method research that has convergent parallel design. The implementation of quantitative and qualitative phases and data collection are done concurrently. The phases are kept independent from each other and then mixed

during the interpretation of the results (Creswell & Plano Clark, 2011). The research design is summarized in Figure 7.

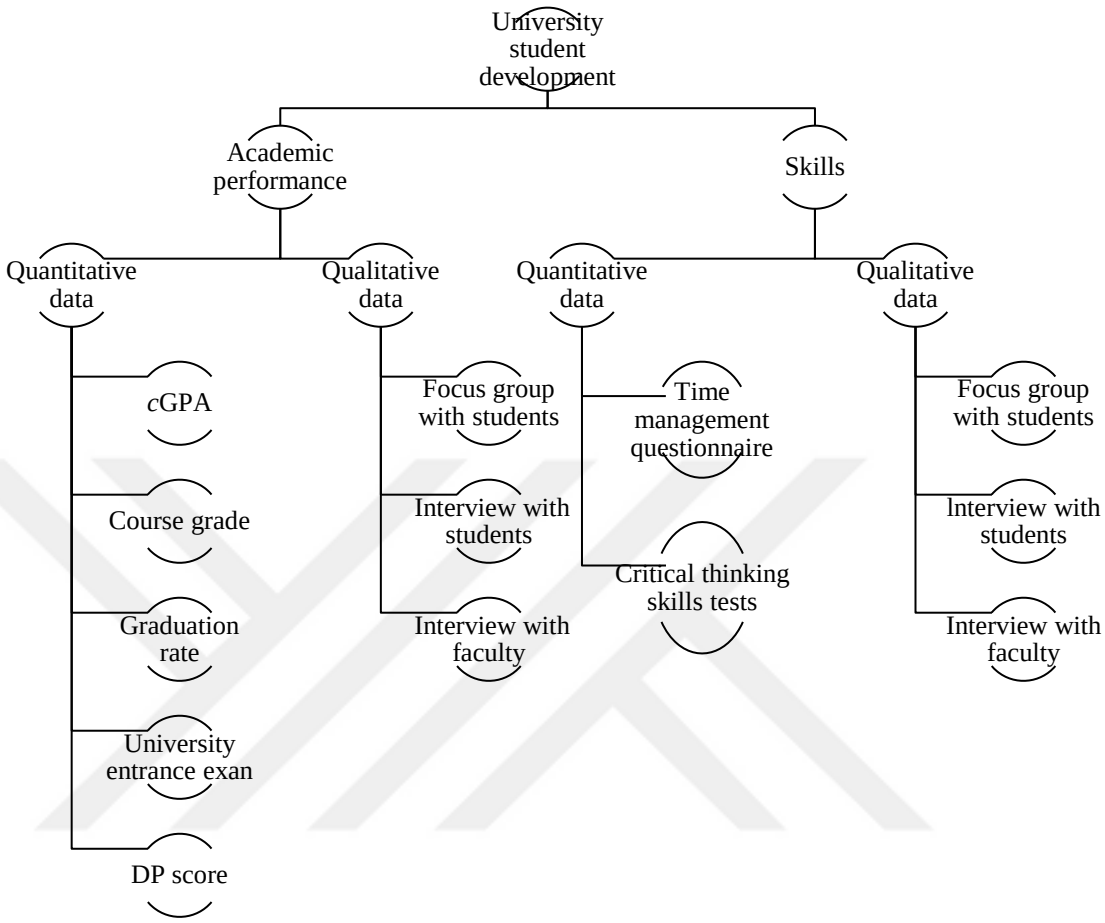

Figure 7. Research design

3.3 Context for the study

The International Baccalaureate Diploma Programme (IB DP), considered as a balanced and challenging program, is offered by some high schools in Turkey. The IB DP is designed for students aged 16-19 at the last two years of their high school education. The first DP school in Turkey was authorized in 1994, and in the span of 20 years the number has reached 38 schools, all private schools except one (IBO, 2016g). In most of the Turkish DP schools, DP is offered as optional but there are a few schools in which DP is obligatory for all students. In addition to following the

MoNEP curriculum for grades 11 and 12, students also take DP subjects. If the contents of each subject in both programs are in alignment, schools may teach both without seeking permission. If there is a discrepancy, approval must be obtained from MoNE, which is granted on presenting a program that meets the minimum requirements of MoNEP. DP requirements are then added-on. Turkish DP schools have cooperated and been able to get approval by working with each other, by arranging both curricula in a way which gives no repetition of the topics studied.

DP schools have to work out how to create such combined programs in a meaningful and manageable way. One solution was to offer DP one year earlier, in the 10th grade, switching to the November exams held 2.5 years later. Doing the DP in the 10^{th} and 11^{th} grades frees up students from November in grade 12, creating time for them to study for the national university entrance examinations held the following March and June. Schools starting DP a year earlier thus hope to help with student time management by resolving the problem of studying simultaneously for two different examinations held over the same period. However, in 2014 changes were announced to the MoNEP weekly school schedule. Both 9^{th} and 10^{th} grades became foundation years with a common obligatory program. This has created an obstacle for starting DP in the 10^{th} grade, leading to Turkish DP schools setting grade boundaries for admission into the DP, or offering preparation courses before the DP starts.

All students have to take the national university entrance exams to be placed at a Turkish university; public or private. University placement of high school graduates is regulated centrally according to student scores in these exams. Students may opt to take one or more of these exams based on the degree programs they intend to apply for.

The Turkish DP schools, and their informal association, have campaigned with the universities to gain some motivational benefits for completing the DP. Some private and non-profit foundation universities, wishing to attract DP students, grant them scholarships of varying percentages according to their IB Diploma scores; or allow double major and/or internal transfer rights from one department or faculty to another on meeting certain criteria. For example, DP students with DP diploma scores of 30 or higher, if successful in all courses taken in the university first semester with a *c*GPA 2.80 or higher, might transfer from one faculty to another.

3.4 Participants

Participants include the majority of DP students who graduated between 2009 and 2013 from 16 IB DP schools in Turkey. Each DP school was asked to provide a list of their graduates' names, the universities where they were placed, their DP diploma scores and their national university entrance exam scores. The scores collected were used for the quantitative research of this study.

Purposive sampling strategy was used to select DP students. According to the list provided by 16 IB DP schools, four universities with the largest number of DP students were identified. A sample of university students was drawn from these four universities. An equal number of NP students were randomly selected from each of the four universities. Purposive sampling strategy is used in order to give a degree of generalizability; sample selected randomly from a complete list of the population (Cohen, Manion & Morrison, 2007). To ensure the NP students had comparable parameters to the DP group, it was ensured that they graduated from similar types of high schools and that they were studying in the same department. It was assumed that both groups had similar socioeconomic status.

With regard to this study, the participants were undergraduate students at the four Turkish universities with the largest number of DP students in Turkey; three of these universities were private, non-profit, foundation universities offering advantages to DP students. It would not have been feasible to select participants from the few other universities in Turkey with DP students, as the number of such students at any one of these universities was very low. The medium of instruction in all four universities is English.

The total number of students participating in the study was 761. All were Turkish citizens. The age range was 19 to 24 years. Of the total number of participants, 385 were female (50.6%) and 282 were male (37.1%). This does not add up to 100% because some participants did not state their gender. The numbers and percentages of DP and NP students are shown in Table 1.

Table 1
Number of male and female DP and NP students

Gender	DP students	NP students
Female	212 (61.1%)	173 (71.2%)
Male	135 (38.9%)	147 (13.8%)
No response	57	37
Total	404	357

The participants were majoring in various faculties, including engineering and science, social sciences and law, and economics. As the medium of instruction was English in all four universities, all required students to pass an English proficiency test, or take an intensive English preparation year, before proceeding to first year undergraduate studies. The distribution of participants based on university and high school program type are shown in Table 2.

Table 2
Frequencies of DP and NP students in the four universities identified

University	DP students	NP students
University 1 (Foundation)	280 (72.7%)	268 (71.2%)
University 2 (Public)	51 (13.2%)	52 (13.8%)
University 3 (Foundation)	38 (9.9%)	40 (10.7%)
University 4 (Foundation)	16 (4.2%)	16 (4.3%)
Total	385	376

Volunteer sampling is the key component of the qualitative research of the study. Cohen et al. (2007) identified volunteer sampling as a type of non-probability sampling which relies on volunteers such as friends, friends of friends or anyone who is interested in the area.

In research question 2, the volunteering participants (DP and NP students) from the two universities with the largest number of DP students formed the sample. The distribution of DP and NP students across two universities is shown in Table 3. Data was collected from 81 students. Not all of those who replied to the questionnaire attended the critical thinking tests and focus group discussions (Table 4).

Table 3
DP and NP students across two universities

University	DP students	NP students
University 1 (Foundation)	38 (86%)	37 (100%)
University 2 (Public)	6 (14%)	0
Total	44	37

In addition, some volunteer students were contacted for semi-structured individual interviews to provide further information and analysis. Students who joined the focus group discussions were asked for individual interviews by e-mail, and four volunteer NP students (3 male) and four volunteer DP students (all female) were interviewed. NP students were studying mechanical engineering, electric and electronics engineering and computer science. Three of the DP students were studying law and one of them molecular biology and genetics.

Table 4
DP and NP students in the sample for research question 2

Instruments	DP students	NP students	Total
Online questionnaire	43 (53.1%)	38 (46.9%)	81
Critical thinking tests	39 (54.2%)	33 (45.8%)	72
Focus group discussions	39 (54.2%)	33 (45.8%)	72
Semi-structured individual interviews	4 (50.0%)	4 (50.0%)	8

Forty-three (53.1%) of them were DP students and 38 (46.9%) of them were NP students. Forty-seven of the participants were female. The number of DP and NP students based on gender are shown in Table 5.

Table 5
DP and NP students based on gender for research question 2

Gender	DP students	NP students
Male	14 (32.6%)	20 (52.6%)
Female	29 (67.4%)	18 (47.4%)

The participants were from engineering, science, social science, law and economics faculties.

Parental education levels were also examined (Tables 6 and 7). The mothers of well over half (60.5%) of the participants' (both DP and NP students) were educated to university degree level: 83.8 % (*n*=36). It is interesting to note that there are five times more mothers with postgraduate degrees in the DP group than in the NP group, as well as nearly five times more fathers.

Table 6
Education levels of the mothers of DP and NP students

Mother's education	DP students	NP students
Primary school	2 (4.7%)	3 (7.9%)
Secondary school	5 (11.6%)	10 (26.3%)
University graduation	26 (60.5%)	23 (60.5%)
Postgraduate degree	10 (23.3%)	2 (5.3%)

Table 7
Education levels of the fathers of DP and NP students

Father's education	DP students	NP students
Primary school	0	1 (2.6%)
Secondary school	3 (7.0%)	5 (13.2%)
University graduation	21 (48.8%)	28 (73.7%)
Postgraduate degree	19 (44.2%)	4 (10.5%)

Tables 8 and 9 show the occupations of the mothers and fathers of DP and NP students.

Table 8
Occupation of the mothers of DP and NP students

Mother's occupation	DP students	NP students
Housewife	10 (23.3%)	10 (27.0%)
Retired	6 (14.0%)	6 (16.2%)
Doctor	6 (14.0%)	1 (2.7%)
Teacher	4 (9.3%)	9 (24.3%)
Pharmacist	3 (7.0%)	2 (5.4%)
Engineer	3 (7.0%)	1 (2.7%)
Civil servant	2 (4.7%)	2(5.4%)
Lawyer	2 (4.7%)	0
Private sector (independent business)	2 (4.7%)	1 (2.7%)
Academician	2 (4.7%)	0
Banker	0	1(2.7%)
Nurse	0	2(5.4%)

Table 9
Occupation of the fathers of DP and NP students

Father's occupation	DP students	NP students
Engineer	13 (30.2%)	7 (18.9%)
Doctor	8 (18.6%)	3 (8.1%)
Private sector (independent business, company owner, publisher)	6 (14.0%)	5 (13.5%)
Retired	4 (9.3%)	4 (10.8%)
Officer (including military officer and civil servant)	2 (4.7%)	4 (10.8%)
Teacher	2 (4.7%)	4 (10.8%)
Dentist	2 (4.7%)	0

Table 9 (cont'd)
Occupation of the fathers of DP and NP students

Economist	2 (4.7%)	0
Pharmacist	1 (2.3%)	2 (5.4%)
Manager (business manager)	1 (2.3%)	2 (5.4)
Academician	1 (2.3%)	2 (5.4%)
Banker	1 (2.3%)	0
Technician	0	2 (5.4%)
Architect	0	1 (2.7%)
Security guard	0	1 (2.7%)

With regard to faculty members, interviewing them is essential for gathering data for this study; as they have detailed knowledge on student preparedness (Cohen et al., 2007). Their observations on students' academic performance and skills allows investigation of student preparedness for university education further.

Before each focus group discussion, students were asked to provide the name of at least one faculty member who might be interested in this research (purposive sampling). Among the list provided, faculty members who had a minimum of five years of university experience were identified and asked to interview individually.

In all, five faculty members from various departments were interviewed (industrial engineering, electric and electronics engineering, molecular biology and genetics, law, English language). Two were female, three male. Four participants were Turkish citizens and one British. Two are professors, two assistant professors and one an instructor. Most have been teaching at the same university for more than 15 years; only the law faculty member is a visiting professor.

3.5 Instrumentation

Data collection was completed in two stages by using both quantitative and qualitative instruments. The quantitative study was prior to the qualitative study. A

questionnaire was identified and adapted, and critical thinking tests were applied. Demographics and time management questionnaire were included in the questionnaire. The rest of the quantitative study was based on the scores of students. The scores, which were used to answer the first research question, are DP diploma scores, national university entrance exam scores, *c*GPA, individual subject course grades (Turkish, English, mathematics, physics, and chemistry) and four-year graduation rates.

The qualitative study relied on focus group discussions and semi-structured interviews to gather data. Consistent with the quantitative study, the qualitative study explored Turkish students' performance, skills and perceptions related to the combination of the international and national curricula. Three data collection tools were used: focus group discussions with students, semi-structured interviews with students, and semi-structured interviews with faculty members. Table 10 summarizes details of the instruments.

Table 10
Instruments used for the study

Instrument	Concerned with (theme)	Sample group (volunteer sampling)	Number of questions	Length of instrument (approximately)
Questionnaire	Demographic data. Time management.	Both DP and NP students at four universities identified.	25 questions (demographic data). 18 questions (time management).	30 minutes
The critical thinking tests	Critical thinking skills.	Both DP and NP students at two universities identified.	Diagrammatic series, numerical critical reasoning, verbal critical reasoning.	1.5 hours

Table 10 (cont'd)
Instruments used for the study

Focus group discussions	Academic performance. Time management. Critical thinking skills.	Both DP and NP students at two universities identified.	An interview protocol was followed. 12 questions were asked.	1.5 hours
Semi-structured interviews	Academic performance. Time management. Critical thinking skills.	Both DP and NP students & faculty members.	An interview protocol was followed. 6 questions (both DP and NP students). 12 questions (faculty members).	25 minutes

Questionnaire: An online questionnaire of two sections was developed and used for collecting data on demographics and time management. Appendix A gives the whole instrument. In the first section, demographic questions (25 questions) were asked to get to know the sample group. The second section was the Time Management Questionnaire (TMQ) (Britton & Tesser, 1991).

TMQ by Britton and Tesser (1991) is composed of 18 items, identified as time management indicators. They are classified into three sub-sections: short-range planning (7 items), time attitudes (6 items) and long-range planning (5 items). The items are on a 5-point Likert-scale. Students' responses were coded 1 for 'never', 2 for 'infrequently', 3 for 'sometimes, 4 for 'frequently' and 5 for 'always'. Items 8, 10, 11, 13 and 16 were reverse-coded as they were negatively worded. The Cronbach's alpha was .80 for the whole instrument.

The critical thinking tests: The critical thinking tests were obtained from and administered by a professional and well-known company called CEB SHL Talent Measurement. The company's products and services address the potential of people

in different areas including personality/behaviour or knowledge/skills (Saville and Holdsworth Limited-SHL, 2015). More information on the company and other sample tests can be found on the CEB SHL Talent Measurement's website; https://www.cebglobal.com/shldirect/tr.

The critical thinking tests were administered by the company's employee who gave the critical thinking tests under exam conditions for 1.5 hours, abiding by the rules determined. The results were delivered online. The researcher was not allowed to see the tests, nor to reproduce them as an Appendix to this study for reasons of confidentiality. The company applies the same tests in different places and times, at a certain cost, and is not willing to allow them to be published. Volunteer students at the four identified universities took the tests which allowed a comparison of the critical thinking abilities of DP and NP students.

The critical thinking test has three components. The first, Verbal Critical Reasoning (VCR), measures the ability to evaluate the logic of various kinds of argument. The second, Numerical Critical Reasoning (NCR), measures the ability to make correct decisions or inferences from numerical or statistical data. Thirdly, Diagrammatic Series (DS), involves the recognition of logical sequences within a series of diagrams or symbols.

Validity and reliability are important requisites for making sound decisions; and it would be wrong to presume that tests are reliable (Thompson, 2003). The researcher must therefore check the reliabilities of the scores being analysed. However, the researcher did not have access to the raw data acquired through the critical thinking tests used in this study. Thus, the score reliabilities could not be estimated in this study. Sample questions of the critical thinking skills tests were included in Appendix B (Saville and Holdsworth Limited-SHL, 2015).

According to the technical report of the company, which provides detailed information regarding norms, reliability, validity and equal opportunities related to the Management and Graduate Item Bank (Saville and Holdsworth Limited-SHL, 2015), Cronbach's alpha coefficients for the two measures used in this study were estimated as .88 and .80 respective to Numerical Critical Reasoning (NCR) and Verbal Critical Reasoning (VCR). According to Nunnally (1978), these alpha coefficients indicate an acceptable level of internal consistency. The bivariate correlation between scores obtained from these two tests were estimated as .54, significant at α=0.05 ($p < .001$). As evidence of the content validity, the technical report states that the tests were designed with references to the abilities required by many professional and managerial jobs to which graduates aspire. Based on meta-analytic procedures across studies with different populations, the technical report also stated that both tests predict competency performance ratings in a meaningful way.

Focus group discussions: Focus group discussions are used to obtain participants' perceptions while they interact with each other, rather than with the interviewer, group interaction helping the ideas of the participants to emerge (Cohen et al., 2007). An interview protocol was developed to reveal differences in perception between DP and NP students about their academic performance and skills at universities. Before interviewing the participants, the questions were piloted with DP students. Based on the feedback gathered, changes were made to two questions.

The focus group discussion protocol (Appendix C) used in this study consisted of four sections: A. Background of the interviewees, B. Critical thinking skills (3 questions), C. Academic preparation (4 questions), and D. Time management (5 questions). The focus group interview protocol is given as Appendix C. Eight focus

groups were conducted, each with eight or nine participants. The participants were both DP and NP students: four focus groups consisted of NP students, and four groups of DP students. The sessions were in Turkish, and each focus group discussion lasted approximately 1.5 hours. Focus groups were named as I, II, III and IV in results. First, the program type (NP or DP) was indicated, and then the name was given.

Semi-structured interviews with DP and NP students: To improve validity semi-structured interviews were used with some DP and NP students who had already participated in the focus group discussions. Interviews were in Turkish and were scheduled to last approximately 25 minutes. The interview protocol (Appendix D) consists of three sections A. Critical thinking skills, B. Academic preparation, and C. Time management; each section with 2 questions.

Semi-structured interviews with faculty members: To evaluate the opinions of faculty members on the performance and skills of students who have different backgrounds (DP or NP), semi-structured interviews were used. The list of students, both NP and DP students, were given to the faculty members. Interviews were in Turkish and were scheduled to last approximately 25 minutes. The interview protocol (Appendix E) consisted of 12 questions related to students' overall preparedness, critical thinking skills and time management skills.

3.6 Method of data collection

DP coordinators of the 19 DP schools in Turkey acted as gatekeepers of the study; 16 schools participated the study (Since some DP schools have recently started to apply DP and they have a limited number of DP students, they were not contacted). 15 of

the schools are private schools, experienced in DP, one is a public school, also experienced. DP coordinators provided the researcher with access to student data, including the universities their graduates attend, DP diploma scores and national university entrance exam scores. Both DP diploma scores and national university entrance exam scores were used to determine the correlation between them.

Student data for the last five years (2009-2013) were used to retrieve the names of DP students and the universities they attend. The five universities with the greatest number of DP students were determined in order to be able to comment on the generalizability of the findings. They were approached in order to have access to data at the university level. Four of them agreed to participate in the study. The sample groups were chosen from these four universities. The approval of the relevant ethics committees was obtained from these universities. The application form for experiments with human participants was filled and ethics committee approval was obtained (Appendix F). All research data were kept confidential. Participants signed an informed consent form (Appendix G) to declare their voluntary participation in the study.

National university entrance exam scores of the DP and NP groups for this sample group were retrieved through the office of each university's registrar. The data were used for comparison of the scores given by the schools. Data regarding university cumulative grade point average (*c*GPA), individual subject grades (Turkish, English, mathematics, chemistry and physics) and four-year graduation rates were also obtained from the registrar's office at each university. The registrar offices of each university supplied data on the four-year graduation rate for these students who started to study at the university in 2009. The preparation year in the study of English was excluded from the data.

The data for the individual subject grades were gathered by calculating the average of the scores of the common courses for first and second year undergraduate studies at each university. For instance, the Turkish subject grade was obtained by taking the average of the freshmen Turkish courses, TURK 101 and TURK 102. Further details related to the courses selected are given in Appendix H. It should be noted that the *c*GPA scores in this study also include many other courses.

Qualitative data were collected by volunteer sampling. Volunteer students at two universities with the greatest number of DP students were asked to take the critical thinking skills tests and join the focus group discussions. An e-mail was sent to students of one university through the registrar's office inviting them to volunteer as a participant in the study. For the second university, personal e-mails were sent out for participation. Focus group discussions were held to triangulate the data (Merriam, 1998). Students who volunteered to take part in the focus groups were asked to bring a peer who is a NP student.

The questionnaire designed to address academic preparation and time management was applied to 72 university students (both DP and NP). Some volunteer students were called for semi-structured individual interviews eight months later. Four NP and four DP students were interviewed individually.

Semi-structured interviews were conducted with faculty members at the university with the greatest number of DP students. Faculty members were asked a comparable set of questions to investigate their perceptions on students with different backgrounds.

3.7 Method of data analysis

For research question (1), the dependent variables were: the national university entrance exam scores, *c*GPA and individual subject scores' averages (Turkish, English, mathematics, chemistry and physics) and graduation rate (graduated from the university after four years of study). The independent variable was whether they studied DP or not at high school; a dichotomous, nominally-scaled variable.

A detailed description of data follows for each dependent variable:

National university entrance exam scores: University placement of high school graduates is regulated centrally according to student scores in different exams. Students may opt to take one or more of these exams based on the degree programs they intend to apply for. Because the scores are not comparable across tests, it was necessary to limit the analysis. Thus, three variables with the largest sample sizes were created to test whether there was a statistically significant difference between DP and NP students. These categories are called TM-1 (exam used for admission to faculties of economics), TM-2 (exam used for admission to faculties of social sciences and law) and MF-4 (used for admission to faculties of engineering).

Cumulative grade point average (*c*GPA): Information regarding the participants' most recent cumulative grade point average was officially supplied by the registrar's office of each university. The *c*GPA score includes grades given for other courses as well as Turkish, English, mathematics, chemistry and physics. The maximum score obtainable is 4.00, the minimum is 0.00. It is assumed that selected universities have similar grading systems.

Individual subject scores (Turk.avrg, Eng.avrg, Mat.avrg, Chem.avrg, Phys.avrg): Subject scores were measured on a traditional 0 to 4 scale for the core courses taken

by first year or second year undergraduates: Turkish, English, mathematics, chemistry, and physics courses. The scores used were those of each participant's most recent individual subject score, officially supplied by the registrar's office of each university.

Four-year graduation rate: Most undergraduate programs at universities in Turkey are designed to be completed in four years, however, some students extend their studies to more than four years because of different reasons such as changing department, failing courses or personal reasons. The four-year graduation rate gives the number of students who successfully graduated from the university after four years of study.

If students successfully graduated from the university after four years of study, data were coded as 'yes'. If students did not graduate at the end of four years, data were coded as 'no'. Graduation rates were compared by presenting respective numbers and percentages for NP and DP students.

Data were analysed using the Statistical Package for the Social Sciences (SPSS) software version 20. Data were first analysed by computing the means and standard deviations for each national university entrance exam score. Normality was checked with skewness and kurtosis values across variables; skewness ranged from – 1.46 to – .05, and kurtosis ranged from – .71 to 2.80. Data is considered adequate for data with a skewness of less than 2 and a kurtosis of less than 7 (West, Finch & Curran, 1995). Data was assumed to be normal.

Independent samples *t*-tests were used to test for mean differences in *c*GPAs, individual subject scores and university entrance exam scores between DP and NP students. All tests were conducted with $\alpha = .05$. Homogeneity of variance was

checked with Levene's test. Independent t-tests gave the opportunity to examine whether there are statistically significant differences between two independent (unrelated to each other) groups (Cohen et al., 2007; Huck, 2012; Pagano, 2010). Since there are limited data, other variables such as family income were gathered as demographic data while administering the questionnaire.

Quantitative data was analysed descriptively, including the mean and standard deviations for the time management questionnaire (TMQ) and critical thinking tests scores. Independent samples *t*-tests were used to compare DP and NP students' TMQ and critical thinking tests scores. The scores of the critical thinking skills tests were collected and reported by the company. The DP diploma scores and the national university entrance exam scores of the same students were analysed by calculating the correlation coefficient. Students DP diploma scores and *c*GPAs were also compared by calculating the correlation coefficient.

The common analytic approach was followed to analyse the qualitative data (Miles & Huberman, 1994). This is an effective type of content analysis: unitizing data, recognizing patterns through categories and themes (Lincoln & Guba, 1985). Recordings were first transcribed and while reading the transcriptions some recurrent themes were identified. The codes were generated inductively (Strauss & Corbin, 1990). These codes were gathered into categories to give a general idea of emerging themes. After this first-level coding, all the categories from each document were grouped under major themes, which were themselves then grouped into final themes. To triangulate qualitative data, previously validated instruments were used. Various types of instruments and data were used to confirm identified themes. Exam scores, course scores, focus group discussions and individual interviews were used to reduce the subjective components. More than one source, both students and faculty

members, were used in the study. However, unique views as important as shared views were not excluded from the study.

3.8 Conclusion

This study aims to explore the performance, skills and perspectives of students on the combination of national and international curricula for university education in Turkey. IB DP was selected as the international curriculum. This is a mixed-method research which collected quantitative and qualitative data concurrently.

Quantitative data on students' performance were collected through the high schools and university admission offices. A time management questionnaire and critical thinking skills tests were used to collect data on students' skills. Data were analysed descriptively by computing the means and standard deviations for each variable. Independent samples *t*-tests were used to analyse quantitative data.

Qualitative data on performance and skills of students was collected through focus group discussions and individual interviews with students. Faculty members were also interviewed individually. Content analysis was followed to analyse qualitative data. The findings of the analyse described are given in chapter 4.

CHAPTER 4: RESULTS

4.1 Introduction

The purpose of this study was to determine the differences between the performance and skills of students who have followed the national high school program plus the international program (international baccalaureate diploma program [DP]) and students who have followed only the national program (NP) in Turkey. The perceptions of students and faculty members as well as quantitative data on students' performance and skills were evaluated.

The research questions, given below for the ease of reference, were explored to contribute to the understanding of the effect of plural curricula on students' performance and skills.

1. With regard to students who have followed the national curriculum plus the DP, and students who have followed only the national curriculum:
    a) Are there any significant differences between the performance in university education of the two groups in relation to their high school preparation?
    b) Are there any significant differences between the skills in university education of the two groups in relation to their high school preparation?
2. What are the perceptions of students of their overall preparedness for university education? How do the perceptions of students who have followed the national curriculum plus the DP differ from those who have followed the national curriculum only?

3. What are the perceptions of faculty members about student performance and skills? How do the perceptions of faculty members about student performance and skills in their university education differ between students who have followed the national curriculum plus the DP and those who have followed the national curriculum only?

4.2 Overview of the results

This chapter addresses each research question specifically and gives the results of the study. Both qualitative and quantitative data are included. The first section is quantitative data, presenting the results of students' academic performance, critical thinking skills test and time management questionnaire. The second section is qualitative data, presenting the results from focus group discussions and individual interviews.

4.2.1 Quantitative data

The first research question which relates to the high school preparation of students for university education is answered by collecting quantitative data: students' academic performance, the results of time management questionnaire and the results of the critical thinking skills test.

4.2.1.1 Academic performance

The first sub-question of the first research question explores the difference between the academic performance of DP and NP students in relation to their high school preparation. Students' academic performance was assessed by analysing students'

numerical scores and graduation rates. The findings of statistical tests on university *c*GPAs (most recent cumulative grade point average, the average of all grades a student has received at university), individual course grades (the average of the scores of the common courses for first and second year undergraduate studies at university), four-year graduation rates, national university entrance exam scores and DP scores performed are also presented.

Independent samples *t*-tests were conducted to evaluate the mean differences in variables with regard to the university performance of DP and NP students. Also, students' four-year university graduation rates were compared by presenting respective numbers and percentages for DP and NP students.

4.2.1.1.1 Comparison of DP and NP students for university cGPA

The means of the most recent university *c*GPAs of the DP students (M = 3.04, SD = 0.65) were found to be statistically significantly higher than the means of the *c*GPAs of the NP students (M = 2.69, SD = 0.69): $t(759) = 7.22$, $p < .05$, $d = 0.52$, indicating a medium effect (Cohen, 1988). This positive effect indicated a noteworthy difference in favour of DP students.

4.2.1.1.2 Performance in Turkish courses

The mean scores for the Turkish courses taken by DP students in the first years of their undergraduate programs (M = 3.59, SD = 0.73) were not found to be statistically significantly different from the mean scores of NP students (M = 3.24, SD = 0.80): $t(479) = 5.02$, $p > .05$.

4.2.1.1.3 Performance in English courses

The mean scores for the English courses taken by DP students in the first years of their undergraduate programs (M = 3.27, SD = 0.46) was found to be statistically significantly higher than the mean scores of NP students (M = 2.58, SD = 0.82): $t(759) = 13.10$, $p < .05$, $d = 1.04$. The effect size for this analysis was found to exceed Cohen's (1988) convention for a large effect (d = 0.80).

4.2.1.1.4 Performance in mathematics courses

The mean scores of the mathematics courses taken by DP students in the first years of their undergraduate programs (M = 2.49, SD = 1.06) were not found to be statistically significantly different from the mean scores of NP students (M = 2.32, SD = 1.17): $t(544) = 1.80$, $p > .05$.

4.2.1.1.5 Performance in chemistry courses

The mean scores of the chemistry courses taken by DP students in the first years of their undergraduate programs (M = 2.75, SD = 0.78) were not found to be statistically significantly higher than the mean scores of NP students (M = 2.44, SD = 0.76): $t(88) = 1.94$, $p > .05$.

4.2.1.1.6 Performance in physics courses

The mean scores for the physics courses taken by DP students in the first years of their undergraduate programs (M = 2.54, SD = 0.82) were not found to be statistically significantly different from the mean scores of NP students (M = 2.29, SD = 0.91): $t(304) = 2.44$, $p > .05$.

Table 11 shows means and standard deviations of *c*GPA and individual subjects selected.

Table 11
Means and standard deviations of *c*GPA and average scores of individual subjects; Turkish, English, mathematics, chemistry, physics

	DP students	NP students			
	Mean (Standard deviation)	Mean (Standard deviation)	n	df	t
*c*GPA	3.04 (0.65)	2.69 (0.69)	761	759	7.22*
Turkish	3.59 (0.73)	3.24 (0.80)	481	479	5.02
English	3.27 (0.46)	2.58 (0.82)	761	759	13.10*
Mathematics	2.49 (1.06)	2.32 (1.17)	546	544	1.80
Chemistry	2.75 (0.78)	2.44 (0.76)	90	88	1.94
Physics	2.54 (0.82)	2.29 (0.91)	306	304	2.44

*$p < .05$

4.2.1.1.7 Four-year graduation rate

University graduation rate (successfully graduated from the university after four years of study) is given only for the cohort of 2009 (N = 140; 70 DP students) because the others were still continuing at university at the time of the research. Table 12 shows the graduation rates of DP and NP students for the cohort of 2009.

A Chi-square test of independence was calculated comparing the frequency of graduation rate of DP students and NP students. A significant interaction was found, χ^2 (68) = 0.001, p<.05. DP students are more likely to graduate (61.4%) than NP students (22.9%) in four years. For the remainder of both groups, it took longer than four years to graduate. There was no drop out from their university of any person in the sample.

Table 12
DP students and NP students' four-year graduation rates for the cohort of 2009

		DP students		NP students	
		Frequency	%	Frequency	%
Four-year graduation rate	No (not graduated in 4 years)	27	38.6	54	77.1
	Yes (in 4 years)	43	61.4	16	22.9
Total		70	100	70	100

χ^2 = 0.001, df = 68, p<.05

4.2.1.1.8 National university entrance exam

Three variables with the largest sample sizes were created to test whether there is a statistically significant difference between DP students and NP students with regard to the national university entrance examination. These categories were called TM-1 (faculties of economics), TM-2 (social sciences and law faculties), and MF-4 (engineering faculties). Table 13 shows means and standard deviations of TM-1, TM-2 and MF-4 scores of DP and NP students.

The means of TM-1 scores of DP students were found to be statistically significantly lower than the mean scores of NP students. The effect size calculated using Cohen's *d* was -0.45, indicating a medium effect (Cohen, 1988).

The means of TM-2 scores of DP students were found to be statistically significantly lower than the mean scores of NP students. The effect size calculated using Cohen's *d* was -0.05, indicating a medium effect (Cohen, 1988).

The means of MF-4 scores of DP students were found to be statistically significantly lower than the mean scores of NP students. The effect size calculated using Cohen's *d* was -0.44, indicating a medium effect (Cohen, 1988).

In all three categories of university entrance exam studied, NP students gained significantly higher scores than DP students.

Table 13
Means and standard deviations of university entrance examination scores of DP and NP students

Exam category	DP students Mean (SD)	NP students Mean (SD)	n	df	t
TM-1	380.729 (58.61)	407.652 (63.90)	107	105	-2.24*
TM-2	418.174 (67.01)	447.976 (52.41)	151	149	-3.01*
MF-4	465.446 (55.24)	486.805 (41.31)	244	242	-3.40*

*$p < .05$

4.2.1.1.9 The correlation between DP score and university entrance exam; the correlation between DP score and cGPA

A Pearson product-moment correlation coefficient was computed to assess the relationship between students' DP diploma scores and university entrance exam scores. There was no significant correlation between the two variables, r (319) = .150, p > .05, indicating a small effect (Cohen, 1988).

A Pearson product-moment correlation coefficient was computed to assess the relationship between students' DP diploma scores and university *c*GPAs. There was a positive correlation between the two variables, r (319) = .439, p < .05, indicating a moderate effect (Cohen, 1988).

4.2.1.2 Skills

The second sub-question of the first research question explores the difference between the skills of DP and NP students in relation to their high school preparation. Students' time management and critical thinking skills were tested. Students' skills were assessed by analysing the results of the time management questionnaire and the

critical thinking skills test. The findings of the statistical tests performed are given below.

4.2.1.2.1 Time management questionnaire

The data were analysed descriptively, including the mean and standard deviation for the results relating to the time management questionnaire (TMQ) for DP and NP students (Table 14). Independent samples t-tests were conducted to evaluate the mean differences in variables with regard to TMQ average scores.

The mean TMQ scores of DP students were not found to be statistically significantly different from those of NP students. The result shows that DP students are slightly, but not significantly, better in short-range and long-range planning and attitudes towards time management than NP students.

Table 14
TMQ results for DP students and NP students

	DP students	NP students			
	Mean (SD)	Mean (SD)	n	df	t
TMQ average	3.06 (0.56)	2.92 (0.49)	81	79	1.178

4.2.1.2.2 Critical thinking skills test

The critical thinking test has three different scores: Numerical Critical Reasoning (NCR) scores, Verbal Critical Reasoning (VCR) scores, and Diagrammatic Series (DS) scores. The data were analysed descriptively, including the mean and standard deviation for each critical thinking test score separately for DP and NP students (Table 15). Independent samples *t*-tests were conducted to evaluate the mean differences in variables with regard to different critical thinking skills test scores.

The Numerical Critical Reasoning (NCR), the Verbal Critical Reasoning (VCR) and the Diagrammatic Series (DS) mean scores of DP students were not found to be statistically significantly different from the mean scores of NP students.

Table 15
Critical thinking skills tests results for DP and NP students

	DP students	NP students			
	Mean (SD)	Mean (SD)	n	df	t
NCR	18.36 (5.48)	20.18 (5.76)	72	70	-1.373
VCR	34.46 (3.66)	35.82 (4.53)	72	70	-1.405
DS	28.64 (5.20)	29.70 (5.27)	72	70	-0.852

4.2.2 Qualitative data

The second and third research questions were answered by collecting qualitative data.

The second research question, students' perceptions of their overall preparedness for university education, was analysed through focus group discussions between groups of up to 20 students, and through individual interviews of students. The third research question, faculty members' perceptions of student performance and skills, was analysed through individual interviews with faculty members.

4.2.2.1 Students' perceptions through focus group discussions and individual interviews

The main findings of the focus group discussions and individual interviews are presented in a coherent and structured way as follows.

Students' responses:

Firstly, three categories were identified.

- The impact of the high school on the university
- Social life at university
- Academic life at university

Each of these three categories was then subdivided into three sections.

- Academic performance
- Critical thinking skills
- Time management skills

For each section within each category, the positive and negative comments of DP and NP students were summarized. Table 16 shows this structure in diagrammatic form.

Table 16
Diagrammatic form of the results of qualitative data

Categories	Sections	DP students & NP students
The impact of the high school on the university	Academic performance	Positive and negative comments
	Critical thinking skills	Positive and negative comments
	Time management skills	Positive and negative comments
Social life at university	Academic performance	Positive and negative comments
	Critical thinking skills	Positive and negative comments
	Time management skills	Positive and negative comments
Academic life at university	Academic performance	Positive and negative comments
	Critical thinking skills	Positive and negative comments
	Time management skills	Positive and negative comments

Faculty members' responses:

Faculty members' individual interviews enabled two further sections to be added.

- Student profile
- Subject selection

4.2.2.1.1 The impact of high school on the university

The positive and negative comments of NP and DP students on 'the impact of high school on the university' category are listed in Table 17. Related to 'the impact of high school on the university', the results of academic performance, critical thinking skills and time management skills are given. For each category, positive and negative comments are identified.

Table 17
Major findings of focus group discussions and individual interviews on perceptions of DP and NP students on the impact of high school on university

	The impact of high school on university	
Academic performance	DP students	
	Positive	Negative
	• acquired critical thinking skills • self-confidence (esp. Turkish/ English/science) • learn how to answer the questions • complete both MoNEP and IBDP • multi-tasking • education system similar	• does not help to improve regular study habits
	NP students	
	Positive	Negative
	• prepared better for mathematics/science • analytical skills	• didactic • chronological • education system different • Turkish/English not effective (no essays) • training for exams

Table 17 (cont'd)
Major findings of focus group discussions and individual interviews on perceptions of DP and NP students on the impact of high school on university

Critical thinking skills	DP students	
	Positive	Negative
	• extended essay • TOK • Turkish/English classes (essays) • science exam questions • school culture • additional subjects • holistic curriculum	• no negative comments
	NP students	
	Positive	Negative
	• class discussion • depending on the teacher • inquiry	• curriculum • memorization • exam oriented • no social activities • didactic • dershane (cram courses)
Time management skills	DP students	
	Positive	Negative
	• multitasking • crisis management • extended essay • prioritization • individual DP subjects	• not have regular study habits (that causes tm problems) • national university entrance examination
	NP students	
	Positive	Negative
	• counselling	• no organizer • no room for self-planning

The comments of DP students on 'academic performance' were mostly positive. They said that they acquired their critical thinking skills at high school. They reported positive changes in self-confidence; they especially noted increased confidence in Turkish, English and science. Also, DP students agreed that they learned how to answer questions in an ideal way at high school as clarified by a DP student in focus group discussion I:

> For example, one of the biggest skills we gained in DP is to answer a question fully and to do this in the clearest and most concise way. This is very beneficial for me in the exams. This is a skill I gained in high school; not high school actually but DP.

Individual interviews with DP students revealed similar results. All interviewees emphasized the importance of having classes in English in DP. They said they have a good level of English, which was a distinct advantage. Since the education language is English at university, they were than able to participate well. Also, DP students said that they acquired a better general cultural background with different subjects offered, such as TOK. The holistic curriculum of DP allowed them to study science and literacy courses at the same time. They practiced both laboratory report preparation and essay writing. A DP student stated: "I took science, psychology and mathematics courses. This helped me to have a general background on different topics". Another DP student commented on how he can write laboratory reports easily with DP:

> I study science now, we used to evaluate the weaknesses on the evaluation section of a laboratory report. It is same at university, and some of my friends have hard time to write this section but I got used to it.

DP students discussed being part of NP and DP at the same time as an advantage in that it helped them to engage in simultaneously occurring tasks. Most of the DP students said that DP and the university have similar education systems, with student evaluation being based on similar criteria in both systems. DP students stated that both DP and university education emphasize the understanding of the subjects, not memorization. A DP student in focus group discussion IV explained:

> Measurement and evaluation criteria at university are very similar to the ones we were graded in DP. For instance, we used to prepare presentations or write

> reports in DP. Now, we do the same things at university. Also, we were very busy to study both national program and DP. We learned how to overcome these intense situations in high school. Now, the university is very intense and we can show how to deal with those things. I think DP contributed to this.

The comments of NP students on the 'academic performance' category were mostly negative, whereas DP students gave the lack of regular study habits as the only negative example. NP students stated that the school education system was didactic and very different from that of the university, which created a challenge for doing well at university. They further stated they were trained for the national university entrance examination, rather than for university education. One NP student expressed the same idea during his individual interview. He said he did not study anything related to his university work. He stated:

> … there is also physics other than maths. Only 10% of (high school) physics classes were connected to my department. I study computer engineering and I learned nothing about my department in high school. We start with such a lack.

Several of the NP students commented that there were not enough learning activities in Turkish and English such as writing essays to help them with university courses. One NP student in focus group discussion IV stated, "A study towards the university entrance examination was adopted. We used to answer multiple choice questions even in English classes. I had no English when I entered the university".

However, in many cases, they later provided examples of opportunities to improve their analytical skills, saying they were better prepared in high school for mathematics and science than for languages and social sciences. One NP student in focus group discussion I stated, "I think the university has shaped my personality more, in terms of learning, I only learned skills in math in high school".

One NP student during the individual interviews confirmed the positive effect of the university on his study habits. He said he had a different learning style at university:

> I started to study in a different way (at university) not like in high school. The answer is in front of your eyes on a multiple choice exam so you do not have to work hard. Teachers (high school) lecture and solve a hundred questions. Teachers (university) here expect too much, more personal effort. So I was like stunned, then I think I recovered.

When asked about the impact of high school on university education with regard to critical thinking skills, DP students' perceptions were very positive. They had no negative comments. They said their schools' culture together with the holistic curriculum of the DP allowed them to attend different activities or take additional subjects. Many of them named Theory of Knowledge, Turkish and English as subjects that helped them improve their critical thinking skills. The essays they had written for these subjects and the extended essay process were useful in the preparation of assignments at university. In focus group discussion III, a DP student explained:

> Thanks to TOK and English courses that I have taken at high school, the English courses in my first year (and even a humanity course in my second year which included 600-800 word assignments) were OK. Some of my classmates had a hard time to complete these assignments, which were very easy for me to complete because of the courses that I took at high school.

A DP student during his individual interview agreed on the benefit of language courses in DP. Not only essay writing but also interpretation/analysis skills of students were improved in DP. He stated: "We read and review a lot of books especially in literacy courses, so we are better at interpretation".

They also mentioned the benefit of science exam questions in this respect:

> None of the physics or mathematics questions we answered in DP were solved with formulas directly. You needed to think first, for example, you needed to ask yourself 'should the uncertainties be included?' or 'should I calculate this one?'. I think this part is very different.

The comments of NP students in the 'critical thinking skills' category were a mix of positive and negative, but more inclined toward the negative. Although they provided examples of instances when they did inquiry or class discussions at high school, they said that this was dependent on the teacher. A NP student during individual interviews gave an example: "There were discussions only in philosophy, and it was something our teacher does extra, not part of the curriculum".

NP students highlighted the negative effects of the national university entrance examination which oriented the high school curriculum, and gave difficulties in the use of critical thinking skills at university because of the didactic system experienced at their high schools. They also commented on the lack of social activities like clubs or group work which help to improve critical thinking skills at high school. Most NP students reported that they had to memorize information to be successful in the national university entrance examination. As an example:

> … in terms of learning, we learned the information in a way that will be asked in the exam instead of discussing it in different ways, I think. That was how it happened for me. Now, it has changed at university, we actually have experienced the gap between high school and university education.

Both DP and NP students discussed the definition of critical thinking skills separately to identify the key aspects of critical thinking skills. In the focus group discussions, DP students used more of key words such as analysis, questioning and creativity included in the definition of critical thinking skills to define critical thinking, as compared to NP students. DP students often provided many examples of

different kinds of activities they had experienced that helped to improve their critical thinking skills, such as watching and commenting on movies, philosophy courses, debates and discussions, and learning how to write essays. A DP student in focus group discussion III said: "When we finished high school, we were reading *Waiting for Godot*, *The Metamorphosis* and then interpreting what the author of the book said. So we are really fast critical thinkers". Another DP student in focus group discussion I stated:

> Simply I love watching movies, I watch them very often. For example, I can see and catch the fine details such as a criticism or an image easily. While my friends are watching the same movie, they do not notice the details, they try to see. I can see the details now … again, for example, there are people who say 'the movie was good, I liked it' and there are people who discuss the movie. I am in the second group.

A few of the NP students stated that reading a book, meeting new people and visiting new places helped them to improve their critical thinking skills, but they were not comfortable about defining critical thinking. In focus group discussion II, one NP student, who was in the philosophy department gave his definition of critical thinking. It was then accepted by the others in the group.

> Now, there is a thought and you will not accept it immediately. First, you will look for the arguments of this thought, and the premises of this thought to reach the conclusion. You will see how acceptable the premises are. Then, you might have a counter argument. This does not mean that you reject the whole argument but you will want to say something opposite, not only 'I don't accept this thought'. You will also substantiate your argument...You will respond to the argument with other arguments, and you will either confirm, 'I also believe it because of these reasons' or 'I'm against it on the following issues because of these reasons' firmly ... within certain frames.

The majority of the DP students considered themselves to be critical thinkers, whereas most NP students did not. In focus group discussion I, one of the DP

students said: “When I have questions in my mind, definitely I ask the instructor several times to explain the things that s/he did not mention before...”. Another DP student, during his interview, also said he thought he was a critical thinker since he thinks more on the subject, comments and queries. One NP student in focus group discussion I stated, “Personally I perceive/respect someone else's criticism or someone else's thoughts but if my opinion feels right, I insist a lot on it”.

Both DP and NP students commented both positively and negatively on the impact of high school on the university with regard to time management skills. The positive factors for DP students were the extended essay and individual DP subjects: they said these aspects of their high school program helped them to cope with time management. Some students stated they prioritize the tasks. They believe they are good at crisis management and multitasking because they had to finalize many tasks in a limited time. However, some DP students said they did not gain regular study habits at high school because of the amount of work involved, including studying for the national university entrance examination as well as the DP exam. Some DP students said that they study on the last day, but they ‘got things done’. A DP student in focus group discussion II said: “I am a person who does everything at the last minute; I especially do Turkish assignments at the last minute. I write the assignments on the last night and upload at 4.00 in the morning to finish my job”.

There were also positive and negative comments related to time management skills during individual interviews. While studying NP and DP together in high school helps some students, it affected the others negatively. An example of a positive comment: “I had a lot of work in high school. NP and DP together. I had to manage my time well. I needed to gain the ability to work and focus over a long time”. An example of a negative comment: “I can’t focus on anything much. I could not have a

regular study habit while I try to execute NP and DP at the same time and jump from one to another".

On the other hand, NP students emphasized the importance of regular study: regular or continuous study was the most common study habit. Comments were also made about reviewing course material, completing assignments, listening well in class, and summarizing. When asked where they developed their study habits, DP students were unanimous in their answers: elementary school and high school. NP students gave a variety of answers such as personality, family, elementary school, high school or hard-working friends.

NP students mentioned the benefits of counselling as the only positive part of their high school program, emphasizing the importance of guidance. One particular student demonstrated this perspective:

> A little earlier I mentioned everything has a deadline and it will be done on the last day, in this style. There is a list of things to do and their deadlines. Up to that date, every day is for the thing scheduled and that work will be completed on that day. For that day do not assign something else. My counsellor suggested this technique when I was confused, we developed it together. I am a messy person who cannot keep a planner.

One of the negative factors of the high school program for NP students was the lack of training on time management. They said that they never used any type of organizers in their previous education. Two NP students mentioned the same idea during individual interviews. They said they complete the assignments at the last minute. One of them said: "I have no habit to study the subject before the class. I only study two or three days before the exams. That's all. It is something I developed in high school". NP students stressed the fact that their time was planned by their teachers or family beforehand, so they never found an opportunity for self-

planning. A NP student in focus group discussion II said: “Time management was better in high school because everything was planned by my family, the hours to get up or go to bed and the hours to study”.

4.2.2.1.2 Social life at university

The positive and negative comments of NP and DP students on ‘social life at university’ category are listed in Table 18. Related to ‘social life at university’, the results of critical thinking skills and time management skills are given (There is no argument on academic performance). For each category, positive and negative comments are identified.

Table 18
Major findings of focus group discussions and individual interviews on perceptions of DP and NP students on social life at university

	Social life at university	
Academic performance	DP students	
	Positive	Negative
	N/A	N/A
	NP students	
	Positive	Negative
	N/A	N/A
Critical thinking skills	DP students	
	Positive	Negative
	• no taboos • questioning • movies	• no negative comments
	NP students	
	Positive	Negative
	• variety of friends • different perspectives and ideas	• no negative comments

Table 18 (cont'd)
Major findings of focus group discussions and individual interviews on perceptions of DP and NP students on social life at university

Time management skills	DP students	
	Positive	Negative
	• no positive comments	• stress • irresponsible friends • very busy • no room for self-planning • traffic jam
	NP students	
	Positive	Negative
	• responsible friends	• personal • irresponsible friends

The comments of both DP and NP students in the 'social life at university' category with regard to critical thinking skills were all positive. However, in many cases, the examples they provided were different. DP students stated that there are no taboos at university, meaning they have enough freedom to express themselves or question the ideas of others. They ask any questions on topics if they wish. NP students reported that the variety of friends at university help them to see different perspectives and ideas. A NP student in focus group discussion IV stated:

> ... about this issue I think people are very effective. I do have a wide variety of friends; I currently have roommates who are atheist, feminist or revolutionary. I was against some of their thoughts before. Now, some might become more logical. And we discuss, for example a friend who is an atheist makes a joke which may be funny; normally this is against my beliefs. Now, I am more prone to think, so I think meeting people is effective.

Comments about the category of 'social life at university' were all negative with regard to time management skills for DP students. There were no positive statements. Comments were made about the stress, the busy schedule, and therefore no room for

self-planning. Other factors affecting negatively on their time management were irresponsible friends and traffic jams. A DP student in focus group discussion II said: "I am always very busy … It is more like I don't plan anything, actually in a way everything, in chaos and intensity, is completed on time". Those with cars, who travelled in the rush hour to get to early classes, commented on the volume of traffic.

The comments of NP students about the category 'social life at university' with regard to time management skills were both positive and negative. Some NP students said that time management is more personal and is not gained through education. They reported their friendships may or may not help in better time management. Some responsible friends help them to set goals, plan or work on the tasks, but some irresponsible friends waste valuable time. A NP student in focus group discussion II said: "Someone who is responsible keeps everything in his mind or his agenda, then he lets us know what is the following".

4.2.2.1.3 Academic life at university

The positive and negative comments of NP and DP students on 'academic life at university' category are listed in Table 19 below. Related to 'academic life at university', the results of academic performance, critical thinking skills and time management skills are given. For each category, positive and negative comments are identified.

Table 19
Major findings of focus group discussions and individual interviews on perceptions of DP and NP students on academic life at university

	Social life at university	
Academic performance	DP students	
	Positive	Negative
	• intention to get more courses • not working hard to pass • timesaving (similar course materials-novels)	• lots of homework
	NP students	
	Positive	Negative
	• applied classes at university • lots of homework • critical and analytical	• grade concern
Critical thinking skills	DP students	
	Positive	Negative
	• no positive comments	• memorization • not improving critical thinking skills • no evaluation level questions • try to teach critical thinking skills didactically
	NP students	
	Positive	Negative
	• improves critical thinking skills • in-class discussions • research (technology, internet)	• no negative comments
Time management skills	DP students	
	Positive	Negative
	• organized instructors • study better at university • university schedule • attendance requirement	• no negative comments
	NP students	
	Positive	Negative
	• no positive comments	• high/unrealistic expectations • stress • unsuccessful academically • living in dormitory • no room for self-planning

DP students were unanimous in the comments they gave on the category 'academic life at university' related to academic performance. They reported they intended to take more courses because they felt that they did not need to study hard to pass, especially during their first year. They stated that first year undergraduate courses are not challenging enough because similar material was covered in high school. A DP student from focus group discussion I said:

> While selecting the courses and preparing my schedule, I took extra courses instead of having free periods. I have already taken fourth year undergraduate courses and passed them successfully. During this semester, I would have signed up for my ninth course but my mother changed my password, so I could not do it.

All DP students during individual interviews stressed how well they are prepared for the university courses. They said DP helped them to do better academically. As an example:

> In maths and chemistry, the topics I study at university were very similar to DP especially at 1st year (university). That's why I was doing better compared to my friends by studying less. If not the same books, the lessons were following the same format as in similar books in English classes. We were continuously writing essays, I knew the techniques.

As DP students mentioned 'lots of homework at university' as a negative factor, NP students stated it positively. A DP student during individual interview said that he was not satisfied with the length and format of the assignments. He said: "We write extended essay and long exams in DP. We prepared oral presentations. Now, they expect us to complete an assignment in 300 words only".

NP students perceived having lots of homework as an advantage to improve their academic skills. Homework in the laboratory classes at university helped them to

refine their practical, critical and analytical skills. A NP student in focus group discussion I said, "Because of regular homework, I studied regularly". However, they expressed their frustration with the grading system at university. It is clear from the responses that NP students see the benefits of the assignments but they think not all assignments should be graded. A NP student in focus group discussion I said:

> The reason why I usually do not study is the grade concern, I am tired of it. Since I am in the engineering department, there is a lot of assignments. I don't agree. There might be a midterm or labs but not all of them have to be graded.

There is a conflict between the perceptions of DP and NP students on the 'academic life at university' related to critical thinking. While the comments of DP students were all negative, the comments of NP students were all positive. For example, DP students expressed concern over the lack of assignments to improve critical thinking skills at university. They discussed a variety of factors that fostered these negative feelings. Memorization at university was noted as one such factor. Some DP students stated that instructors may try to teach critical thinking skills didactically at university, instead of practicing by asking evaluation level questions. However, NP students spoke positively of the lectures, assignments and research possibilities at university. They reported positive experiences with in-class discussions to improve their critical thinking skills. A NP student in focus group discussion I stated: "I think I have better critical thinking skills with in-class discussions at university and my personal effort, than at high school".

DP and NP students had quite different perspectives on the last category 'academic life at university' related to time management skills. The comments of DP students were all positive with no negative comments, whereas those of NP students were all negative with no positive comments. DP students acknowledged their well-organized

faculty members and how helpful they were in improving students' time management to do well academically. The liberty to choose their own schedule helped them to allocate time for extracurricular activities and assignments. The attendance requirement in university courses also helped them to stick to their timetable. A DP student in focus group discussion III said: "I am in a program with a small number of students and teachers. For example, the teachers know every student and their problems".

On the other hand, NP students reported that they are unlikely to be good at time management because of the university's high and unrealistic expectations. They feel they are unsuccessful academically, especially for the first year of the university; this situation causes a lot of stress and increases poor time management. They have trouble coping with deadlines even those who live on campus. Most NP students try to accomplish the tasks given in a rush, so there is no room for review. A NP student in focus group discussion IV stated:

> The difference was at high school I lived in a dorm. It has a certain system you must follow whether you want it or not. The teacher schedules your time. You do the same work on Wednesdays in November and Wednesdays in May.

When they were asked to define time management, nearly all DP students discussed deadlines. They thought of time management more in terms of meeting due dates, being calm, being active and "getting things done". The techniques they used to manage their time were listed as organizers (technology such as applications or calendars on smart phones) and prioritization. A few also said that studying in the library helped to meet the due dates because they could concentrate on their task easily and complete on time.

Most NP students used key words such as flexibility, control, balance, and planning to define time management. There was no complete definition of time management in focus group discussions: few NP students saw it as accomplishing tasks in order of priority, or mentioned multitasking, or using scarce resources efficiently. A few NP students said they plan daily or monthly and make a "to do list". NP students in focus group discussion III gave the following examples: "the ideal thing in most people's mind … but the thing most people cannot accomplish"; "the things people cannot fit into their time"; "I think prioritization should be done correctly".

4.2.2.2 Faculty members' perceptions through individual interviews

This section discusses the major findings of individual interviews with faculty members on students' performance and skills in university education. Additional to the categories 'academic performance', 'critical thinking skills' and 'time management skills', two more categories were identified. These categories are called 'student profile' and 'subject selection' (Figure 8). Individual interviews with faculty members were named as 1, 2, 3, 4 and 5.

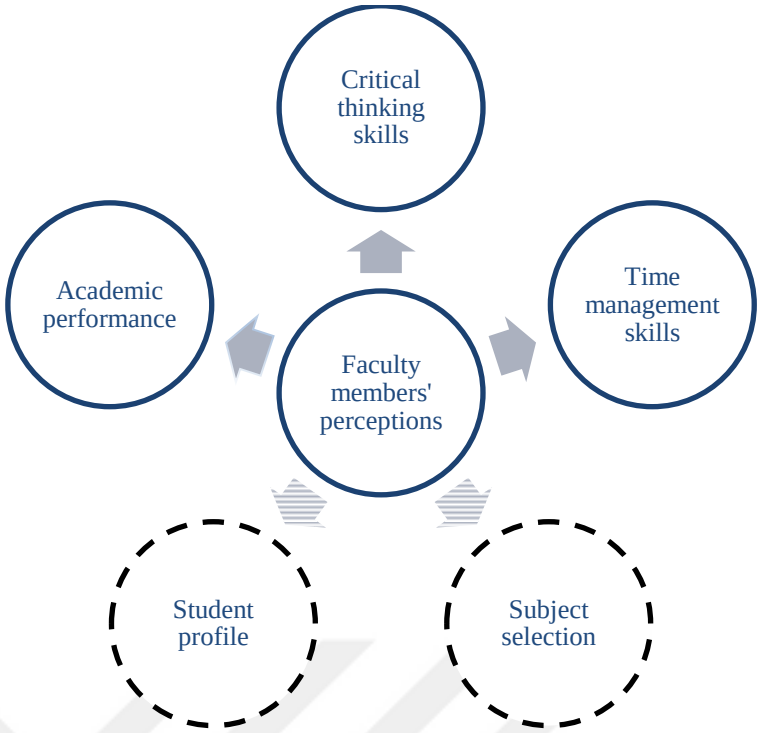

Figure 8. Major categories of individual interviews on perceptions of faculty members

All faculty members said that they do not know the background of every student, neither do they know much about their students' high school education programs. They said that they can comment on students they know well only, they could not generalize for every student. They asserted that their classes have a good student profile in general. One faculty member stated: "… students are very good students. They come to the university (department) willingly. They know what they want. I have many students like that. These types of students are coming from all different high schools, so we are lucky".

Faculty members gave a variety of responses related to their departmental needs. Although they said again that it is difficult to generalize the comparisons for everyone, they commented on NP and DP students' performance and skills with

examples they remember or the ones they were given. The main comments on identified categories are summarized separately for NP and DP students (Table 20).

Table 20
Major findings of individual interviews on perceptions of faculty members about student performance and skills at university

	DP students	NP students
Academic performance	• Good in courses • Knowledgeable • Fluent in English but not good in academic writing	• Competent (especially in technical terms) • Science high school graduates are better • Good in passive training
Critical thinking skills	• Questioning • Inquirer • Broader cultural background (TOK)	• Spoon-fed
Time management skills	• More social and a balanced life • Self-discipline	• Fine time management skills
Student profile	• Self-confident • Responsible • Leader in a group work	• Needs to be encouraged
Subject selection	• Need of higher level subjects (mathematics and physics especially)	NA

Faculty members compared NP and DP students with regard to their academic performance. They said DP students are knowledgeable and perform well in subjects such as mathematics and science. An example given by faculty member 1:

> Students who enter our program will generally have most difficulty in mathematics and physics because there is calculus in our program. In addition, we have chemistry and biology courses which get more challenging. I really did not see these (DP) students having difficulties in these courses.

However, DP students are not competent in technical terms. NP students, especially the students graduated from science high schools, know technical terms and could

easily comprehend the topics in first year engineering classes. Faculty member 2 explained:

> Although they (DP students) lack specific technical competencies, they know how to complete the gap. So, for example, they actually need to put more effort in first year basic engineering courses compared to science high school graduates. But then they catch up, that's my observation.

NP students are better in recall questions. DP students perform better in tasks needing discussion and evaluation. Faculty member 1 stated: "if you ask more knowledge questions than evaluation questions, DP students struggle". Faculty member 3 confirmed:

> … early in passive education, reflecting what is given, they (DP students) are weak. However, later when it comes to the level they will step in, they are better equipped. we actually have these types of exams, first a question tests whether they learned given information then discussion questions which students need to think, discuss and apply. They debate very different topics on this section.

Faculty members described DP students as responsible. They said that DP students actively participate in classes and have a solid background. Faculty member 4 suggested these students should use their background as an advantage and study even harder to improve themselves. He said: "DP provided a very good background … but you need to keep putting it on by using the DP advantage. If you relax in first year then you can't make it up".

Most faculty members said that DP students have a good English level, and can express themselves in a clear way. However, faculty member 5 in English language department commented on the difference between spoken English and written English. He stated:

> … their (DP students) English is much better, usually. They don't generally know how to write a university level academic essay. So, I still need to teach things like citation and I need to kind of move their language in a more formal direction. Both in terms of their writing and even sometimes in their speaking. What I find is that they are very very fluent but they often don't have an idea register. And spoken academic English is actually a very tricky register to mess up because it is a mixture of very formal and very technical English with informal English.

The perceptions of faculty members on students' critical thinking skills are very positive. They believe both groups of students are critical thinkers. Faculty member 2 said: "Students who question and know what to do come to the university". Faculty members mentioned that DP students are better at questioning compared to NP students. They said that most NP students hesitate to ask questions in class. DP students use questioning as a learning tool. An example given by faculty member 4: "… for instance, DP students ask more questions. Asking questions is a very important learning tool. Our typical student does not use this tool". Faculty member 2 compared NP and DP students' reactions to questioning: "… they (NP students) have been spoon-fed, a little simplistic. They are in a mode that you did not tell this part in class why you are asking now while others know that I could ask". On the other hand, they point out that not every DP student has these skills. They emphasized that only the ones who study effectively gained the skills. It is clarified by faculty member 4:

> None of our students who graduated from NP has worked over one minute on any question. Our DP students, for instance, solve the problem by modelling and looking at it from different points but not every DP student can do that. Only the ones who gained this ability in DP.

Faculty members said that DP students are inquirers and they have a broader general cultural background. They benefit from the courses taken in DP. Their readiness for

university study is better. Different faculty members explained: "… they have much broader cultural background, and they are much better at generally critical thinking. … DP students were much better prepared for their university studies". (Faculty member 2)

> … having a good general cultural background. Also, I notice particularly they refer back to the TOK course. Some parts of this course are in my syllabus, actually something like Kant and they all know who Kant was, prior knowledge. I talk about precision and they know what I mean whereas most of the other students don't. (Faculty member 5)

> They are much more prepared to challenge ideas they find in the text. For example, they are better arguing in general. They used to look at arguments and counter arguments ... the DP students do tend to stick out, in a positive way. (Faculty member 5)

Key words such as discipline and balance were used to describe the time management skills of DP students, while although faculty members said that NP students have fine time management skills, they mainly provided examples of DP students. Overall, DP students were considered as a group of students who manage time to give a more balanced life. Faculty member 4 stated: "DP students plan their time to live a more balanced and social life". Faculty member 1 pointed out: "DP students manage their time very well. They participate in cultural activities at university and they can also work at university introduction and tours as a part time job to gain some money. And they do not miss their classes".

DP students developed self-discipline. They discipline themselves to complete assignments and attend other activities at the same time. Two faculty members commented on the self-discipline of DP students: "they have a serious discipline, this catches my eye, they come every lesson without exception. I do not know if this is

related with their high school education or just coincidence. However, they are ready for every lesson". (Faculty member 3)

> Very disciplined, first noticeable thing is time management. They are doing this very well. They can do a lot of things together and they don't miss any homework. I have never seen in this student group that they miss homework, laboratory work or reports. (Faculty member 1)

Faculty members' perceptions on the student profile differ between NP and DP students. Faculty members said that DP students developed a self-confident and responsible student profile. Faculty member 3 gave an example of the professional attitude of one of his students and referred to the comment of an employer: "He is not like a summer intern, he is no different from an intern who just graduated from the university". Another comment on DP students' self-confidence:

> I feel DP students are more confident. They do a final project for graduation and present their projects. I listened to a DP student who is presenting, you would think that the CEO of a company is talking. They are much better at expressing themselves. (Faculty member 2)

NP students hesitate to participate in class. They need to be encouraged. They feel anxious or even offended when faculty members ask questions directly. Examples were given:

> DP students are very comfortable of asking questions and talking in class. I think they are more confident … when you ask questions to other students, they say why is she asking me now, or she is always picking me because she does not like me. (Faculty member 1)

> In the first days, most are reluctant to talk … it creates a little stress ... but I encourage them, I ask if there is something you would like to say about it, and I tell them let's evaluate it together … DP students do not need that. (Faculty member 2)

Having a broad perspective was also considered as part of the character of a DP student. Faculty member 1 stated: “I observe that they look at a topic from a different perspective. I mean they can analyse a topic from a broad perspective”. Further, most faculty members commented on the leadership skills of DP students. They said that these students are usually the leaders in group work. They take on responsibilities for the sake of the group. Different examples were given by faculty members in different departments: “Some DP students take the leading positions in groups in project lessons … entrepreneurs”. (Faculty member 4)

> … taking a leading position and more responsibility. When the team struggles, they carry out some of the things. As far as I understand they are more prone to these types of works, to group work. I have seen they tend to take on the workload to resolve the conflict. (Faculty member 2)

> These students have leadership skills … for example, we have compulsory internship in the third undergraduate year. They find a place for internship on their own easily because they are good at correspondence. They stand out in the interviews. This might be because they have self-discipline or leader skills. (Faculty member 1)

Faculty member 1 stated DP students are not only the leaders in a group but they are also good members of a group. They know how to work as a team. An example is given: “They can organize, most of my students usually can’t work as five people in two laboratories. These students work well in a group, this is an important skill, they are actually team workers”.

Some faculty members gave examples of the empathy of DP students. They can adapt to certain situations easily. They can interact socially and make connections with other people. They can make sense of their experiences. Faculty member 3 explained how his student accommodates to the environment during his internship since the environment itself is a significant factor:

> … has work discipline, fits into the environment … when I saw him wearing a suit in the office, I told him you already look like a real lawyer. And he said he feels like it is needed. Although he hasn't been told to follow a dress code, he thinks it is the appropriate thing to do.

Finally, faculty members in the sciences emphasized the importance of subject selection for DP students in high school. They have observed the effect of higher level subjects on student performance. They suggest that DP students should choose relevant courses as their higher level subjects. They believe DP students who study higher level mathematics and physics in high school do better in engineering. However, they stated that success in higher level DP courses is important. It is not enough to take the course but students should get a good grade in these subjects to do well in university. One example is given from each science department: "They had higher level mathematics. I know they had no difficulties in mathematics because they had covered some topics already". (Faculty member 1)

> Our students who had taken higher level mathematics or physics do well but not all students choose these subjects in high school. If they don't, they are then trying to understand university level physics with only first and second year high school physics background. (Faculty member 2)

> Especially students who had taken higher level mathematics and physics are more successful but there is an important point here … their scores on these courses are also important for us. It is observed they are more successful if their scores are higher. It is not enough only to take the diploma in DP, the success in mathematics and physics especially is very useful in electrics and electronics engineering. If they are successful in biology, they might continue in molecular biology and genetics. (Faculty member 4)

4.3 Conclusion

The differences between NP and DP students with regard to their performance and skills in university education as related to their high school preparation were

compared. The results of the quantitative and the qualitative data were evaluated holistically to determine how NP and DP students' potential have been shaped by their high school education.

Quantitative data on the academic performance of students were assessed by analysing their university *c*GPAs, individual course grades, four-year graduation rates, national university entrance exam scores and DP scores.

National university entrance exam scores of NP students were higher on average than those of DP students. There was no correlation between DP diploma scores and university entrance exam scores. With regard to the performance of these students at the university level, DP students outperformed NP students in English courses but there was no significant difference between them in Turkish, chemistry, physics and mathematics courses. There was a correlation between DP diploma scores and university *c*GPAs.

The data relating to the 2009 entry cohort showed that nearly three times more of the DP students completed their university in four years.

Quantitative data on students' skills were assessed by analysing the results of a time management questionnaire and tests in critical thinking skills. There was no significant difference between the scores in time management questionnaire and critical thinking skills tests.

Qualitative data of this study were concerned with the perceptions of students and faculty members on the academic performance and skills of students at the university. The perceptions of NP and DP students for university life were compared in three categories: 1) the impact of high school on university education, 2) social life at university and 3) academic life at university. DP students were very positive

about *the high school impact on university education*. They had acquired critical thinking skills at high school. They had increased confidence in subjects. On the other hand, NP students thought their school system was didactic and very different from university. They did not have many active learning activities.

Both groups of students were very positive about *the social life at university*. Although they pointed out different examples, both groups said there are good number of critical thinking related activities in the social life. DP students thought that the busy academic schedule of the university might have made them stressful. However, NP students thought that social life at university is more personal.

The perceptions of DP students on *the academic life at university* were both positive and negative. DP students intended to take more courses especially during their first year but were concerned over the lack of assignments to improve their critical thinking skills at university. NP students spoke positively of lectures, assignments and research possibilities at university.

Analysis of the perceptions of faculty members provided similar results to the quantitative study on the perceptions of students. In general, faculty members said that they had a good student profile, both for DP and for NP students. They described the DP student profile as confident, responsible and with leadership capabilities. They were clear that both groups were successful in their courses but NP students could be more competent, especially in technical terms, whereas DP students were more fluent in English and they had a broader cultural background. While stating that it was actually quite difficult to generalize further between DP and NP students, they commented on the enhanced effect of the higher level subject study by DP students.

It can be concluded that the research methods described in chapter 3 were fully able to lead to the results given in chapter 4. The statistical testing indicated that DP students performed better at university. The qualitative and quantitative results together gave examples of NP and DP students' performance and skills which explain findings from the statistical testing. The data gathered were sufficient in both quality and quantity to enable the analysis and discussion which follow in chapter 5.

CHAPTER 5: DISCUSSION

5.1 Introduction

This study focused on student development for university through the combination of national and international programs in Turkey. This chapter discusses the results and connects them to the related literature. Implications for practice and further research are also presented.

5.2 Overview of the study

The study compared the academic performance and skills of students who followed the national program (NP) with those of students who followed both the national program and the International Baccalaureate Diploma Programme (DP). The first research question involved data from high schools related to DP diploma scores, and from universities related to student entry scores and academic performance (*c*GPAs, individual subject scores, four-year graduation rates). The data also included scores on time management and critical thinking skills tests. The second and third research questions involved data from the perceptions of students and faculty members of student development and preparation for university. Naturally, the resulting data was complex, and was discussed within the complexity paradigm.

The quantitative data obtained through an online questionnaire, the critical thinking skills tests, the qualitative data obtained through focus group discussions with students, and individual interviews with students and faculty members were triangulated. Focus group discussions were helpful in obtaining participants'

perceptions as they interacted with each other rather than formally with the interviewer. Individual interviews with students were used to improve validity.

The quantitative data was analysed descriptively and inferentially. Independent samples *t*-tests were used to see if there was a significant difference between numerical scores. The qualitative data was analysed by using a common thematic approach.

The three main areas, *academic performance*, *critical thinking skills* and *time management skills*, are discussed to understand the effect of the combination of NP and DP on students' development for university life.

5.3 Major findings

5.3.1 Academic performance

In summary, this study compared the academic performance of NP and DP students according to their national university entrance examination scores, and their success later in the university according to their *c*GPAs, individual subject grades, and four-year graduation rates. The correlation of DP diploma scores with university entrance exam scores as well as university *c*GPAs were calculated separately. In addition, the perceptions of students and faculty members on students' academic performance were explored.

Firstly, with regard to the university entrance exam: the scores of 385 DP and 376 NP students in the competitive national university entrance exams, held in the last semester of high school, were compared. The sample consisted of DP and NP students studying at the four Turkish universities with the largest number of high school DP graduates in their undergraduate populations. With regard to the three

categories (TM-1, TM-2, MF-4) of the national university entrance examination scores used for admission to faculties of social science and law, economics, and engineering, it was found that NP students had statistically significantly higher scores than DP students.

Possible reasons for this finding are as follows. The backwash effect of the national university entrance exam is huge. High school students in grades 11 and 12 preparing for this exam attend lessons in all major subjects where the emphasis is on ensuring that the students learn and process both the knowledge to answer the multiple choice questions they will face and the skills to answer these questions correctly at speed. As multiple choice questions tend to favour recall over thinking skills, and also require no writing skills from the examinee, the backwash effect, the need to ensure student success, encourages teaching which is didactic, detailed and involves no training in writing, discussion, collaboration, or other skills. This in fact, might encourage isolation and memorization.

Further, in addition to lessons at school, many students who intend to enter the exam, attend *dershanes*, cram courses, where the same content and multiple choice questions skills are further developed.

It is not therefore surprising that NP students achieve on the exam. The DP students are also studying the NP, and as such are subject to some of the same effects as NP students. But, because of the demands of their second curriculum, with extra content material plus a totally different assessment system, they do not have the time to attend *dershanes*, or to practice multiple choice question techniques again and again.

They do, though, gain other skills from their DP studies. The DP assessment includes problem-type, data-based questions, free response, short answer and essay questions,

as well as some multiple choice questions. In addition, extended essay (EE), theory of knowledge (TOK) and creativity-activity-service (CAS) work lead to far more open-ended responses. The backwash effect here is, then, to encourage the teaching and learning of different skills in the lessons of the last two years of high school. Such skills also include of course the use of English, as the Diploma lessons and exams are in English, as well as collaborative work between students, collaborative interactions between students and teachers, and work in the wider community.

Nonetheless, because these DP graduates who intend to go to a Turkish university must have a good score on the university entrance exam, they still have to try to give equal priority to their NP and DP studies. This was noted by Gültekin (2006) who (unlike this study) found that DP students had significantly higher university entrance exam scores (250,680) than NP students (239,843) in Turkey.

In this study, the magnitude of the difference between national university entrance exam scores of NP and DP students was consistent. The negative effect size, with a medium level effect size, across these three categories (TM-1, TM-2, MF-4) showed that NP students had higher scores on average than those of DP students in university entrance exams. In other words, DP students found it easier to get a place at the university of their choice. It seems, then, that DP students who have lower university entrance exam scores are in the same university departments with NP students who have higher university entrance exam scores. The universities that took part in this study are those favoured by DP students not only for their quality or scholarships available, based on DP scores, but because they are known to facilitate the transfer of DP students between their departments or faculties if a student meets a particular DP diploma score followed by a university *c*GPA requirement.

In Turkey, students are placed in a department and university according to their university entrance exam scores. The placement system is complicated, and there is student choice involved, but students can find themselves placed in a department they do not much want, a department which is not their first choice. DP students, aware of their advantage over NP students in this respect, were therefore more able to change their initial decision and transfer to a different department or faculty. They enjoyed the freedom of moving to study in an area they wanted instead of where their national university entrance exam scores placed them, or change their faculty if they found it did not match their interests.

The university *c*GPAs of the students in the sample, plus the scores of individual common subjects showed interesting results: At university level, the university *c*GPAs of the same sample of NP and DP students were higher than those for the NP group (3.04 vs 2.69).

The size of the effect for English courses was over one standard deviation, while it was one half of a standard deviation when their overall *c*GPAs were compared. As discussed above, focus group discussions also revealed that DP students had an advantage over NP students with regard to the use of English (both in class and in written assignments) and in other academic skills learned during high school relevant to university studies. Faculty members also said that DP students have good English, they express themselves in a clear way. DP students, studies in English, over two years at high school, had given them a clear advantage in the use of English.

Even in American universities, where the language is English, Cho and Bridgeman (2012) found that students with higher English scores had higher GPAs. In the current study, since the medium of instruction is English at all four universities, DP students were able to participate well in class, and were probably familiar with

English terms. This might be one reason for their higher *c*GPAs, and their success might be due to the fact that they participate well in class and are able to understand the subject clearly. They are using the advantage of being bilingual. For NP students, however, it takes time for them to feel comfortable in classes since some might never have studied the subjects in another language.

One faculty member in the English language department discussed the difference between the spoken and written English of DP students. He said that DP students were fluent in English but needed to improve their writing and research skills, while stating that they thought the assignments were supposed to be more challenging. The same faculty member agreed this point with the DP students, but explained that the bar had to be lowered to accommodate all students in the class, with very different past experience.

As stated above, students who had followed the DP had experienced curricula and classes which were student-centred rather than didactic. Ateşkan et al. (2015) showed that DP students have advantages compared to the NP group in academic preparation because they followed a program based on learner-centred ideology. Learner-centred design is based on students' interests, needs and experiences (Ornstein & Hunkins, 1998). DP students therefore had opportunities to process information themselves, and enough time to practice their academic skills until those skills became new competencies. DP students were ready for the essay-type, free response university assignments that the other group found difficult. In the focus group discussions, they appreciated the science experiments, report writing, and were able to answer questions clearly and concisely as they had already had experience.

A further advantage was that DP students were accustomed to using technology in the classroom, for example calculators and computers. This gave them another

advantage over their NP classmates, who said that their high school experience had included little in the way of writing essays, group work or discussions. Such skills which they first experienced at university had to be learned there.

University courses include different types of learning, in different types of classes, as well as work in laboratories, studios, computer rooms, libraries, workshops, project rooms, and theatre. The work and study place is considerably broader than that of a normal school classroom, and the learning skills equally wider. It is not surprising that the DP students found themselves at an advantage over their peers.

One point, however, is that the number of DP graduates in any university class would be a lot less than the NP graduates. University instructors faced with such an imbalance in student experience, together with the relatively recent addition of a different type of school graduate, also not surprisingly feel compelled to structure the work of the class towards the abilities of the majority of its members.

This is supported by the fact that the DP students themselves said that their high school education was similar to the university in terms of the emphasis on the understanding of the subjects and student evaluation criteria. Inkelas et al. (2012) similarly found that DP students in United States feel they are well prepared for university courses. Faculty members also said they thought that DP students benefited from the courses taken in DP, especially the higher level studies. They said that these students are knowledgeable and perform well. Further it was thought that the other DP courses such as TOK helped students to have a better general cultural background. On the other hand, NP graduates were said by some instructors to be more knowledgeable in the detail of mathematics and science including technical terms, than in language and social science, which ties in well with the detailed recall knowledge needed for the university entrance exams multiple choice questions.

NP students did not appreciate their high school preparation for the university in the language and social science subjects, but were happy with their preparation in mathematics and science. Even in those subjects, however NP students all agreed that they were taught with a didactic approach, to the test (national university entrance examinations), rather than for university education. This created adjustment problems when they started university, and they too said they had to learn new skills as well as re-learn some habits.

A further aspect of the two groups noted in the results was their attitude to research. DP students stated that their DP work had helped them to be inquirers. Faculty members also identified DP students as enquirers, able to participate in research work and projects. During the individual interviews with faculty members, it was found that they became aware of DP by observing the performance of students in such activities. DP students themselves commented on the benefits of the EE, TOK and CAS in focus group discussions and individual interviews, as helping them to acquire a broad cultural background and an ability to find out for themselves. TOK, which is mandatory for all DP students, aims for students to study knowledge itself. The objective of TOK is, "to reflect on the nature of knowledge, and on how we know what we claim to know" (IBO, 2016j). Morin (1999) criticized current education since it does not put emphasis on the meaning of knowledge.

> … education does not often bother to teach what knowledge actually is. He argues that knowledge cannot be handled like a ready-made tool that can be used without studying its nature, and that knowing about knowledge should figure as a primary requirement to prepare the mind to confront the constant threat of error and illusion that parasitize the human mind. (as cited in Fong, 2006)

The EE and CAS require students to research a topic and write a coherent 4000 words account (EE), and to discover, plan and execute a service activity.

The results of this study detailed the correlation coefficients which were calculated between DP diploma scores and university entrance exam scores, as well as between DP diploma scores and university *c*GPAs. Although there is a positive correlation between DP diploma scores and university *c*GPAs, there is no correlation between DP diploma scores and national university entrance exam scores. In Australia, Edwards and Underwood (2012) also found a high correlation between DP diploma score and university success. This finding suggests that DP is a program for student development for university. In other words, NP students do well in national university entrance exams but they struggle when they enter the university.

One possible explanation might be the difference in assessment between the two high school programs. DP has both internal and external assessment with the internal assessment being both formative and summative. The national system has only external assessment and that is limited to multiple choice questions. Lowe (2000) described formative assessment as the most effective way to improve quality, whereas summative (usually external) assessment is still the measure of performance. Lowe (2000) concluded that this is one of the biggest problems of national programs, in that training students for summative examinations does not assist learning quality as much as a mixture of formative and summative.

The final set of results detailed in chapter four concerned the number of years students took to graduate from their university programs, four years being the usual time expected in Turkish universities. Only one cohort, the class of 2009, had spent four years at university when the research was conducted. The results show that the four-year graduation rate for DP students was nearly three times more (61.4% vs. 22.9%) than that for NP students, and the chi-square statistics reflected a strong relationship between the DP and four-year graduation rate. Of the 70 DP students, 43

finished their four-year degree program on time, as compared to 16 (of 70) of NP group. In the US, Bergeron (2015) found a similar result for the same four-year graduation rate; in her study, DP students' four-year graduation rate (79%) is considerably higher than the national average (39%). Several other studies have shown that DP students are more likely to complete higher education (Edwards & Underwood, 2012; Shah et al., 2010).

Two possible explanations can be examined. One is the English level of DP students and the other study/life skills given by DP. In Kadıoğlu and Erişen (2016) research in Turkey, it was seen that students benefit from DP, especially in English: Some NP students said that they had no English when they entered university, and had to spent a preparation year in the English language department. This would automatically be an additional year on their graduation rates. Together with the level of English, the skills they gained in DP, could have helped the DP group to do better in their classes and complete their education in a timely manner.

It is very clear that, for most university students (as well as for their families and instructors) more years than are required to complete a university program will give cause for concern. Repeated courses, extra assignments, higher cost and delayed entry into full time employment can cause anxiety, distress and misery.

A high school program which helps students to progress as expected through his or her university career should be encouraged.

Academic skills are as important as the scores gained through educational programs. This is the reason why student skills on university education were explored in this study. The next two sub-sections explained the findings on the skills, critical thinking and time management.

5.3.2 Critical thinking skills

Three critical thinking skills tests were administered to both groups. The quantitative results of the three tests, Numerical Critical Reasoning (NCR) scores, Verbal Critical Reasoning (VCR) scores, and Diagrammatic Series (DS), were analysed separately for NP and DP students. They showed that NP students have slightly, but not significantly, higher scores than DP students. NP students have slightly higher ability to make logical deductions (NCR: 20.18 vs. 18.36) and to evaluate the logic of various kinds of arguments than DP students (VCR: 35.82 vs. 34.46). Again, NP students have slightly higher ability to reason logically and flexibly in terms of diagrammatic and symbolic mean than DP students (DS: 29.70 vs. 28.64).

Other studies gave different results. Demir (2009) using a different test found a significant difference between critical thinking skills of NP and DP students in Turkey. And in these other studies, DP students were identified as critical and analytical compared to their peers in alternative programs (Bayülgen, 2012; Dixon et al., 2014; Hood, 2012).

Although the present study showed no significant difference between the two groups in the quantitative results, the qualitative results supported those of the four studies mentioned above. The behaviour of the DP and NP groups exhibited interesting differences in focus group discussions and individual interviews, as summarized in the following paragraphs, leading to the conclusion that critical thinking skills can be manifested in different ways.

For example, in the focus group discussions, DP students were motivated and engaged, with critical awareness and ideas. NP students were less questioning and critical. They spoke when addressed, with shorter answers, listening to others rather than volunteering ideas.

DP students were relaxed. In focus group discussions made up of nine or ten members, they had friends they knew from their high school or other DP schools. There seemed to be close affiliation among them. Most DP students wish to be at the universities identified because of the advantages offered, which increases the possibility of DP students being together. Even in focus group discussions, together with those from different faculties, meeting for the first time, they were open, asked questions and tried to learn about each other immediately. Their expectations were similar, which helped them to understand each other easily. They were motivated and engaged full-time. Managing DP focus group discussions required skill from the moderators as groups tended to diverge from the topic because they were full of ideas that they wanted to share. They criticized everything freely. As discussed earlier, DP students are used to these kinds of activities, group discussions, from their high school education. They practiced questioning, writing reflections or preparing presentations.

NP students were more rigid. They did not seem to have the same bonds with each other that the DP group had. This affected their motivation because it is more intimidating to be in an unfamiliar group. Some of them even said that they were happy to have met new people during the focus group discussions. Managing the focus group discussions of NP groups was easier because, although the students were engaged and on task, they preferred to speak only when addressed or invited individually. Earlier discussion in this chapter indicated that NP students' high school education was more task-oriented. They were given knowledge-based assignments instead of reflection or evaluation. In the focus group discussions, NP students' remarks were shorter and they preferred to listen to others rather than volunteer their ideas. They seemed to be more accepting of others' ideas than critical

or questioning. It was easy to stick to the plan with them because they did not go off on a tangent. However, the behaviour of NP was slightly different during their individual interviews: they were more relaxed and motivated to share ideas. They expressed themselves better one-on-one, this shows that they are more result-oriented.

Faculty members also said that most NP students hesitated to ask questions in class. Although faculty members believed that both NP and DP are critical thinkers, they said that most DP students were better at questioning when compared to the NP group.

One explanation was given by the NP students themselves. They had to memorize information to be successful in the national university entrance exams. This situation had affected both the teaching/learning activities in class and the social activities outside the class. While DP students provided examples of activities such as reading a lot of books, writing essays and class discussions, NP students said that these kinds of activities were dependent on their teachers, and were common.

In the individual interviews, NP students suggested further explanation. They highlighted rote learning and the lack of activities which foster critical thinking as negative effects of the university entrance examination on their critical thinking skills, possibly arising from the form of the university exam and its multiple choice questions. Çam Aktaş and Güven (2015) showed that the use of multiple choice questions in high school is seen to be a disadvantage to the development of critical thinking skills. Also, Koç (2007) stated that a traditional classroom environment would not help students to improve their higher level critical thinking skills. Faculty members also offered an explanation when they stated that NP students were better in recall questions instead of the tasks needing discussion and evaluation, whereas

DP students were good at analysis and interpretation questions, no doubt arising from their previous studies.

Again, the positive effect of DP subjects such as TOK, Turkish and English on students' critical thinking skills were mentioned as contributory factors. Hughes (2014) described TOK as a course on critical thinking, it offers opportunities to stimulate skills; the main emphasis of the course is on the development of such skills (Cole et al., 2014). In focus group discussions, DP students suggested that these subjects along with the extended essay process were one reason to improve their critical thinking skills. DP students explained that there are fewer activities/assignments which foster critical thinking at university. However, NP students' views on the assignments given at university are completely different. They spoke positively of the activities and assignments at university in focus group discussions and individual interviews. Since both groups were comparing the assignments at university with their high school experience, it can be argued that DP experience on critical thinking skills are more positive compared to NP experience.

In summary, this discussion has centred on the difference between the quantitative and qualitative results of the study on critical thinking skills. While NP students had slightly, but not significantly, higher scores in the critical thinking tests than DP students, the critical thinking skills of DP students were discussed more positively in focus group discussion and individual interviews. Both students and faculty members described DP students and DP experience as good examples of critical thinking skills. The explanation for the difference was suggested by students themselves, and lies in the type of education they received at high school. One further point which might help to explain this difference is the format of the critical thinking skills tests. Multiple choice questions had to be answered in a limited time period during testing,

which is a format NP students were well used to, so they may have been at an advantage. Yet, critical thinking skills are not easy to measure (Ennis & Weir, 1985).

5.3.3 Time management skills

The results of the Time Management Questionnaire (TMQ), which gave scores of both NP and DP students as a test of their time management skills, showed no meaningful discrepancy. DP and NP students' scores were very close, 3.06 and 2.92, although indicating room for improvement as they were scored out of 5. The focus group discussions and individual interviews were in concord with this result. Participants of both groups responded similarly to the questions and neither group came up with a complete definition of time management. They listed some time management techniques but they accepted that they do not follow these techniques to accomplish their tasks and perform better at university.

The conclusions can be drawn that all students in the sample could benefit from learning and using effective time management. Both groups were clear that they were still learning. However, DP students, more than NP students, said that they adapted easily to the work requirements at university. They attributed this to their experience of meeting long-term deadlines at high school and juggling two programs at the same time. On the other hand, NP students described the first year at university as stressful. Although they felt they were hard-working students, insufficient academic preparation for university education was a disadvantage for them, especially in the first year of the university. In focus group discussions, most NP students emphasized that the high expectations of their instructors made it hard to be successful academically. Trying to cope with the expectations caused panic and made time management difficult, affecting their success negatively. They believed

the lack of training in time management in high school was a factor in this situation. DP students are more aware of the deadline concept because they have a lot of experience from a process requiring long-term assignments such as the extended essay, and consequences when deadlines are not met. Hertberg-Davis and Callahan (2008) argued that students who have time management problems struggle the most in DP. By studying two programs at the same time, they gain organizational skills (Demir, 2009).

Dealing with the overload of fulfilling the requirements of both high school programs was also reflected in focus group discussions and individual interviews, where students gave further suggestions to explain this finding. They repeated the need to get things done, one by one, manage crisis situations and keep calm. They were forced to use organizers (and smart phone calendars) because of the need to keep all the deadlines imposed on them under control, and needed to use prioritization techniques to prevent possible overlapping of DP and NP requirements. The DP students said they thought they had learned not to panic easily, and felt able to benefit from university life both academically and socially.

With regard to the NP group, however, the deadline concept was not within their radar. They explained their poor result by saying that they were not used to having assignments with long due dates in high school. As a result of a more teacher-centred approach, it was the teachers and the school administrators who planned their program. In addition, the cram courses they attended at weekends to prepare for the university entrance examinations did not leave much time to plan. In fact, they did not have much personal control over their time in the last two years of high school. There was no room for self-planning. In the absence of time management training, some school counsellors had tried to impose the use of ‘to do lists’, and guide them

for planning their time, but there were not enough school counsellors at high schools to do this comprehensively.

The literature also suggests that most students believe DP helps to improve their time management skills. Taylor and Porath (2006) found that students feel they develop better time management skills in the DP. DP students will have better skills at the end of the program (Coca et al., 2012; Conley et al., 2014; Culross & Tarver, 2007). In focus group discussions, DP students said that they are good at crisis management and multitasking, although Zeller (2008) has described multitasking as an ineffective way of time management. Similarly, Abate (2008) stated that multitasking concept is disadvantageous and detrimental to students' learning. While DP students are trying to fulfil the requirements of two programs, they had to jump from one program to the other. Guy (2000) has discussed how two programs placed at the same time might cause unnecessary or even harmful burden on students, so being part of two programs might be why they could not develop regular study habits and did their assignments at the last minute.

About performance at university, DP students said that the university's busy schedule made them stressful. Since they were in the habit of completing their assignments at the last minute, it became stressful with many assignments, supporting Akcoltekin' (2015) finding that students' anxiety level decreases with better time management skills. DP students submit their assignments on the due date but they do not submit earlier and this situation contributes to their stress level. However, the proper use of time would help them to show better academic performance (Adebayo, 2015).

Although what most students reported supported the research results in that they do not have good time management skills, faculty members were happy about their

performance. Faculty members, in individual interviews, said that NP students have fine time management skills, and were even more positive about DP students' time management skills. DP students, they said, are a group of students who manage their time well, they do not miss classes and they complete their assignments on time. These students manage their time to have a more balanced life and they had developed self-discipline. One possible explanation of this difference in perspectives is the understanding of time management. Faculty members, in their answers, were looking only at the final product; they usually do not know the progress over one assignment. Although DP students complete their assignments on time, they complete the assignments in hurry, which is not observed by faculty members.

One further aspect of this topic refers to study habits in general, comments about which can be related to time management.

The only complaint DP students had about this was about the lack of regular study habits due to the overload of managing two programs together at high school. However, they even said it made them more resilient, learning about crisis management and multi-tasking, which made them more self-confident about being able to get things done. The positive effect of the workload on DP students' academic performance has been discussed in other studies as well (Demir, 2009; Yılmaz, 2005). Being used to the challenge of the overload, the DP students in the current study said they tended to take extra courses in addition to the normal program load of the university.

The study revealed that DP students perform slightly better on time management, while neither group is perfect. Discussion and explanation from all suggest that DP students start to practice time management earlier, in high school, compared to NP students. NP students rarely find room for self-planning in high school.

In general, DP students succeed at university because they are the product of a complex system. Each program, NP and DP, is composed of separate elements. These separate elements emerge into a different system which is complex. The interactions between the elements of both systems are continuous, and this situation makes the system difficult to study (Heylighen, 1996).

The components of the complexity theory such as relationship, self-organization, feedback and communication are synchronized in NP and DP. The interrelationships between the elements of these systems form a dynamic environment. This dynamic environment with the combination of NP and DP and its complexity-based curriculum help DP students to improve their academic performance. DP students encountered different opportunities and experiences, they are influenced by different educational theories. Since there are opportunities for activities for students to engage in, such as class discussions, these students are also creative thinkers. According to Morrison (2003), higher order thinking flows from a complexity-based conception of the curriculum, which includes alternative activities for different learners. However, some aspects of these systems may not reach a compromise. In this case, the fact that parts did not fuse in this new system might influence students' time management skills negatively. The complexity-based curriculum with a heavy workload on students might inhibit their time management skills.

5.4 Implications for practice

The findings from this study have implications for different stakeholders such as the Ministry of National Education (MoNE), the International Baccalaureate Organization (IBO), the IB DP schools in Turkey, their administrators, teachers, students and parents, and the universities the DP graduates attend.

Turkish universities do not systematically collect information about the performance of DP students. Some faculty members were uncertain about the elements of the DP. IBO, universities or DP schools might consider developing strategies to engage more with faculty members.

For universities, especially those that have a larger DP student population and those trying to attract more DP students, the need to offer more challenging courses or granting credits for DP higher level courses at the first year should be considered. There are plenty of examples of such applications from around the world (IB Related Policies in Canada, 2014; IB Related Policies in USA, 2014).

Considering the differences in attitudes of NP and DP students, it seems that universities may think of some other measures to help the adjustment period of both groups. Universities are usually quick to give remedial help, but leave those who have come more equipped on their own. This may also partly cause problems of continuity in the initial years. In focus group discussions, there were examples of some who had lost time because they had adjustment problems and tried to discover what they really wanted to do and where they belonged. It was mentioned that counselling was the most helpful aspect of high school. In the transition period at the university this need seems to be still there.

Some solutions may be possible. Examples may be the introduction of advanced courses in English or choices of electives, to present DP students with higher challenge and create opportunities to widen their horizons. Orientation activities could help the two groups blend in earlier. CAS type of activities, peer help, counselling or advising systems may also be strategies universities can offer to help them engage more positively with their university work.

Moreover, DP students seem to be in need of some direction to use their energy positively. NP group could also benefit from some direction and activities (such as discussion groups) to open up their horizons and loosen their self-control in a supportive environment. By becoming skilled at critical thinking, they can make more use of their creative potential. They could benefit from some mentoring from academic staff or students.

There are also implications for MoNE in respect of the overuse of the scholar-academic ideology principles such as didactic methods and teaching to the test, which do not help students at university. Use of technology, like computers and calculators are very much a part of life and university education in the 21st century, and policies restricting their use could be revised. With the new developments in the Turkish Education system from 2005, the curricula began to incorporate a constructivist approach focusing on learner-centered teaching activities instead of teacher-centered approaches; and encouraging learning by inquiry and experience. However, there is a tendency towards test training to prepare students well for these exams. This approach might affect students' critical thinking skills negatively. The effect of the university entrance examination on the high school education should be re-considered.

Additionally, language teaching, both first language and second language, is not effective, especially for those universities where the medium of instruction is English. The efficiency of the learner-centred based methods is demonstrated by the success of DP students at these universities. These can be taken into consideration in revising language programs for secondary education in Turkey.

The scores of DP students on the university entrance examinations may be lower than they could have been since these students need to cover two programs at the

same time. The amount to be covered cuts into time to prepare for university entrance examinations. Therefore, families might be inclined to give up DP. More information on the programs and their effects should be given to families and students by school administrators and teachers. Stakeholders including students and parents should be knowledgeable about the long term impacts. DP schools and their administrators should also help students to choose the subjects, especially higher level subjects, according to their future higher education choices. Faculty members emphasized the importance of subject selection, especially the higher level subjects relevant to the department, for DP students in high school.

Curriculum planners, the MoNE and the IBO, school administrations or university provosts need to be wary of the fact that students are in need of improving time management, and practice should be given to students by time management training. The programs might be revised to create more opportunities to develop time management skills. DP examples of due dates, responsibility giving and severe consequences for failing to meet deadlines may be adopted. Parents and school administrators should be aware of the need to give responsibility and room for managing their own time to high school students, accompanied by guidance and tools such as organizers. Parents and teachers should be conscious about giving the responsibility of time management to the students themselves. This is a life skill and training for it needs to start early in school life.

5.5 Implications for further research

The study looked at the outcomes of the implementation of DP within the national education system in Turkish high schools. Students' academic performance and skills were compared to understand the effect of the combination between NP and

DP. However, the results cannot be generalized to other schools in other countries. To further explore these findings, this study should be replicated in other high schools which implement DP or other international programs into their current systems.

The findings from this study suggest further research on academic performance and skills of NP and DP students who study abroad. Additionally, DP students' career choices and employment might be analysed. Longer term studies would contribute a stronger understanding of the strengths and weaknesses of DP implementation and delivery in Turkey.

The four-year graduation rate was analysed for only one cohort, the class of 2009, in this study. When the research was conducted, only this group had spent four years at university. A follow-up with the 2010 and later cohorts at their four-year stage could be studied.

Further research needs to be done into the reasons of DP selection by students and families. The reasons why students decide to complete DP instead of other programs might be discussed. The effect of the social economic status of the family and the importance given to language learning on DP selection might be an area of research.

Students are flexible not only to choose to take the DP; they also have some flexibility to choose the course they want to study in the program. James (2007) identified that DP students' course/career requirements are influenced by the higher level (HL) subjects they choose. Students' subject selection in DP might also be an area to study. The factors that affect students' subject choices, especially HL subjects, can also be researched.

The findings from this study also have implications for research on students' higher education choices. Students' departmental choices in higher education and the comparison of their performance in different departments may yield interesting results. The analysis of the effect of their HL subject choices on their performance at university may also be helpful to understand the outcomes of the combination of NP and DP.

Finally, other stakeholders' perceptions such as administrators, teachers or parents might provide insights on the implementation of DP within national education system. It may be helpful to know their perceptions to improve these programs. Their perceptions on students' developments through the combination of NP and DP might be researched.

5.6 Limitations

This study made every effort to provide complete and comprehensive insights into the DP students who attended universities in Turkey. The outcomes of the study mainly represent findings from DP students who attended private schools since there is only one public DP school in Turkey, and no students from there participated. There were three DP schools (out of 19) that did not provide information about their graduates (e.g., their preferred universities and departments, DP diploma scores, national university entrance exam scores). Therefore, some of the thoroughness of the study may have been affected. Also, national university entrance exam scores are not comparable across years, it was necessary to limit the analysis.

The focus group discussions were limited to students who were attending one of four Turkish universities; therefore, other universities within Turkey were not included in the study. Furthermore, no universities outside of Turkey were represented. Only a

limited number of faculty members participated in this study; however, their views were consistent among each other and limited the need to find other perspectives.

Students provided background information and demographic data when they submitted their questionnaire. It is possible this information was incomplete or inaccurate and could have altered control of the predictors when conducting the analysis comparison questions. Other variables outside the parameters of the study could have affected student responses as well. For example, since students in this study had already attended six months of university, there is a chance their university experience, rather than the DP, could have influenced their performance and skills.

5.7 Conclusion

This study has explored students' performance, skills and perspectives on the combination between national and international curricula for university education in Turkey. To accomplish this aim, students who followed both NP and DP and students who followed only the NP were compared. Students' academic performance and skills were compared in order to gain an understanding of their development for the university.

The data analysed helps to explain the difference in the performance of the two groups, and leads to the conclusion that the education received at high school plays an important role on how a student can use his or her potential at university. The results suggest that a DP education helps to activate a student's potential and convert it into competencies, which enable them to succeed better at university when compared to NP students.

The study followed up the quantitative research by considering the detailed perceptions of the two groups of students and faculty members. It was seen that during their high school years, DP students had opportunities to process information themselves and enough time to practice their academic skills. Since the two programs have different teaching approaches, students had to incorporate both into their learning processes. DP students valued their high school education and highlighted the effect of it on their academic performance at university. Mainly they reported the similar academic approaches used both at high school and university. Both groups had valuable study habits from high school, but the more skills-based DP, especially the demand it placed on them for free-response critical thinking and oral expression, stood them in good stead at university. Those studying in English at their university were at a particular advantage.

With regard to critical thinking skills, it was seen that the majority of DP students considered themselves to be critical thinkers, whereas NP students had a hard time even defining the term. DP students highlighted the importance of the TOK course they studied. The subject guide for TOK (IBO, 1987) states that it is central to the educational philosophy of the IB. "Among its aims are: developing an understanding of why critically examining knowledge claims are important, and developing a critical capacity to evaluate beliefs and knowledge claims" (Mackenzie, 2000, p.46). DP students who attended the focus group discussions exhibited these characteristics. However, the NP group did not exhibit the same relaxed brain-storming type of approach, and showed less questioning. They stated that their high school program did not prepare them for the critical approach required at university. Even though there were no significant differences between their critical thinking skills and test

scores, their responses during focus group discussions and individual interviews were quite different.

With regard to time management skills, it was seen that such skills were in need of improvement by both groups. As DP students had to follow both programs at the same time, they were required to be good at managing their time. Especially, the DP program had deadlines that they had to meet, which helped to promote the time management skills of DP students, who exhibited more confidence about accomplishing assignments in a timely manner. Although both groups claimed that they do not have regular study habits, DP students argued that the programs' tasks made them multi-tasking. NP students didn't have many due dates and longitudinal studies that they needed to follow up throughout their high school education. In many cases, their time was scheduled by others, which did not help with building time management skills.

The results of this study and the discussion above lead to the conclusion that the DP prepares students well for university education, and even that the implementation of both programs together enhances academic achievement. The latter is supported by Shah et al., 2010; IB Research Team, 2007; Saavedra et al., 2013 who stated that NP and DP together prepare students better for university studies.

George Walker, one of the founders of the IB system, is on record as saying, with regard to the variety of skills and tasks needed for success at high school and university.

> Personally, I believe that IBO has a great deal to offer in addressing such a range of tasks. The combination of the IB's language policy, its breath of curricular studies and its students' engagement with a variety of modes of learning, does, indeed, give those of us committed to the IB the right to say to national educators 'we believe we have something well worth sharing with you'. (Walker, 2000, p.202-203)

This study has shown that students who follow both NP and DP programs have higher achievement at university than those who follow only the NP. It has also shown that such a combined program places stress on the participants. Bearing in mind the thinking behind complexity theory, it may be that an emergent collaboration of the two programs could be the way forward.

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APPENDICES

APPENDIX A: An online questionnaire: demographics and time management questionnaire

Dear Students,

As a part of my PhD study (Students' performance, skills and perspectives on the combination of national and international curricula for university education in Turkey) you are being asked to complete a short questionnaire.

The purpose of this two part questionnaire is to find out your opinions about overall preparedness for university education. The first section of it is about your demographic information. The second section asks questions about your time management skills.

The questionnaire is voluntary and the data collected is strictly confidential. The data collected will be analysed and used better understand the effect of international curriculum (DP) in Turkey. If you don't know the answer or don't want to answer a particular question then please leave it blank.

The questionnaire will take approximately 30 minutes.

Thank you,

Sıla Sagun

PhD candidate, Bilkent University

Graduate School of Education

silas@blis.bilkent.edu.tr

Section 1: Demographic Questions

Please answer each question;

1. Name (optional):

2. Age and date of birth:

3. Nationality:

4. Mother's occupation:

5. Father's occupation:

6. Mother's highest level of education that is completed:

7. Father's highest level of education that is completed:

8. Have you ever lived outside of Turkey?

9. If yes, how long did you live outside of Turkey?

10. If yes, where did you live?

11. Have you gone to school outside of Turkey?

12. If yes, how long did you study?

13. If yes, where did you study?

14. Current university:

15. Department:

16. Year of study:

17. Continuation: did you transfer from another department?

18. YGS score (optional):

19. LYS score:

20. Score type:

21. Name of your high school:

22. Year of high school graduation:

23. Which program did you graduate from? IB DP + MEB or MEB only?

24. If IB DP + MEB, what is your IB DP diploma score?

25. Were you enrolled in any other programs? If yes, please select all those that apply. PYP, MYP, IGCSE, other?

Section 2: Time management questionnaire (Britton and Tesser, 1991)

Answer the following questions based on your responses.

Part A. Short-range planning

	Never	Infrequently	Sometimes	Frequently	Always
Do you make a list of the things you have to do each day?	1	2	3	4	5
Do you plan your day before you start it?	1	2	3	4	5
Do you make a schedule of the activities you have to do on work days?	1	2	3	4	5
Do you write a set of goals for yourself for each day?	1	2	3	4	5
Do you spend time each day planning?	1	2	3	4	5
Do you have a clear idea of what you want to accomplish during the next week?	1	2	3	4	5
Do you set and honour priorities?	1	2	3	4	5

Part B. Time attitudes

	Never	Infrequently	Sometimes	Frequently	Always
Do you often find yourself doing things which interfere with your university work simply because you hate to say 'No' to people?	1	2	3	4	5
Do you feel you are in charge of your own time, by and large?	1	2	3	4	5
On an average class day do you spend more time with personal grooming than doing schoolwork?	1	2	3	4	5
Do you believe that there is room for improvement in the way you manage your time?	1	2	3	4	5
Do you make constructive use of your time?	1	2	3	4	5
Do you continue unprofitable routines or activities?	1	2	3	4	5

Part C. Long-range planning

	Never	Infrequently	Sometimes	Frequently	Always
Do you usually keep your desk clear of everything other than what you are currently working on?	1	2	3	4	5
Do you have a set of goals for the entire quarter?	1	2	3	4	5
The night before a major assignment is due, are you usually still working on it?	1	2	3	4	5
When you have several things to do, do you think it is best to do a little bit of work on each one?	1	2	3	4	5
Do you regularly review your class notes, even when a test is not imminent?	1	2	3	4	5

APPENDIX B: Sample questions of the critical thinking tests

For each question below, click the appropriate button to select your answer. You will be told whether or not your answer is correct.

Newspaper Readership

Daily Newspapers	Readership (millions)		Percentage of adults reading each paper in Year 3	
	Year 1	**Year 2**	**Males**	**Females**
The Daily Chronicle	3.6	2.9	7	6
Daily News	13.8	9.3	24	18
The Tribune	1.1	1.4	4	3
The Herald	8.5	12.7	30	23
Daily Echo	4.8	4.9	10	12

Question 1: Which newspaper was read by a higher percentage of females than males in Year 3?

A	B	C	D	E
The Tribune	The Herald	Daily News	Daily Echo	The Daily Chronicle

Question 2: What was the combined readership of the Daily Chronicle, the Daily Echo, and The Tribune in Year 1?

A	B	C	D	E
10.6	8.4	9.5	12.2	7.8

APPENDIX C: Focus group discussion protocol

Names_____

Group _____Department_____Grade_____

Interviewed by_____Date_____

To facilitate our note-taking, we would like to audio tape our conversations today. For your information, only researchers on the project will be privy to the tapes which will be eventually destroyed after they are transcribed. You need to sign "the informed consent form" to take part in this research.

We have planned this interview to last 90 minutes. During this time, we have twelve questions that we would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead to complete the questions.

Thank you for your participation.

Introduction

You have been selected to speak with us today because you have been identified as a representative of the group of DP and NP graduates. In this research, we would like to find out if the attributes of the DP learner profile align with similar Turkish national standards, and what role they have on success. We will also try to explore the perceptions of the DP and NP graduates about their preparation at the secondary level for future university education.

Thank you for volunteering to take part in this research.

A. Interviewees background

- Name of students' programs:

  _____

- Years in program: _____
- Number of courses taken this academic year:

  Fall 2013_____ Spring 2014 _____
- Gender: _____
- Age: _____
- Place of residence:

  University residence ____ Off-campus within walking distance ____

  Off-campus within driving/commuting distance ____
- Live with parents? Yes / No
- Employment status: Full-time _____ Part-time _____

  Not currently employed ____ Hours of work per week: _____
- Why did you choose or not choose DP when you were at high school?

B. Critical thinking skills

1. Do you consider yourself a critical thinker? Why or why not?
2. Do you think your high school education provided you with critical thinking skills? Explain by giving examples.
3. What kinds of activities did you go through to improve your critical thinking skills?

C. Academic preparation

1. What do you do throughout the semester to get ready for your courses? i.e. studying in advance, completing homework, etc.
2. Where did you develop this habit? i.e. high school, primary school, family
3. How do you get prepared before the exams? Where did you develop this habit?
4. Did the courses that you studied in high school help you with university courses? Why / why not? How? Can you give example(s)?

D. Time management

1. Define 'time management'.
2. What are the challenges of time management?

3. Talk about a typical university day. What specifically do you do to organize your time?
4. Do you use any time management techniques such as goal setting, prioritization, balanced planning? If yes, how do you use these techniques?
5. How successful do you think you are at managing your time? Do you think your previous education (high school education) helped you to have better time management skills?

Thank you. Are there any other things you would like to share related to our discussion today?

APPENDIX D: Semi-structured interviews with DP and NP students

Name:

Group (DP or NP):

Department:

Year of entrance:

Interviewed by: **Date:**

To facilitate our note-taking, I would like to audio tape our conversations today. For your information, I will be privy to the tapes which will be eventually destroyed after they are transcribed.

I have planned this interview to last 25 minutes maximum. During this time, we have six questions that we would like to cover.

Thank you for your participation.

Introduction

You have been selected to speak with us today because you have been identified as a representative of the group of DP and NP graduates. In this research, I would like to find out if the attributes of the DP learner profile align with similar Turkish national standards, and what role they have on success. I will also try to explore the perceptions of DP and NP graduates about their preparation at the secondary level for future university education.

Thank you for volunteering to take part in this research.

A. Interviewee background

- Gender:
- Age:
- Place of residence (university residence, off-campus, live with parents):
- Employment status (full-time, part-time, not currently employed):
- Why did you choose or not choose DP when you were at high school?

B. Critical thinking skills

1. Do you consider yourself a critical thinker? Why or why not?

2. Do you think your high school education provided you with critical thinking skills? Explain by giving examples.

C. Academic preparation

1. What do you do throughout the semester to get ready for your courses? i.e. studying in advance, completing homework, etc. Where did you develop this habit? i.e. high school, primary school, family

2. Did the courses that you studied in high school help you with university courses? Why/why not? How? Can you give example(s)?

E. Time management

1. Define 'time management'.

2. How successful do you think you are at managing your time? Do you think your high school education helped to have better time management skills?

Thank you,

Are there any other things you would like to share related to our discussion today?

APPENDIX E: Semi-structured interviews with faculty members

Name:

Faculty / Department:

Position:

Years of experience:

Gender:

To facilitate the note-taking, I would like to audio tape our conversations today. For your information, only I will be privy to the tapes which will be eventually destroyed after they are transcribed.
I have planned this interview to last 25 minutes maximum. During this time, we have ten questions that we would like to cover.
Thank you for your participation.

Introduction

You have been selected to speak with me today because some of your students nominated you for an interview. In this research, I would like to find out if the attributes of DP learner profile align with similar Turkish national standards, and what role they have on success. I will also try to explore the perceptions of DP and NP graduates about their preparation at the secondary level for future university education.
Thank you for volunteering to take part in this research.

With regard to students who have followed the national curriculum plus the IB DP, and students who have followed only the national curriculum:

Do you see any differences between the two groups in relation to their overall preparedness for university education? If yes, describe the differences briefly. What could be the reason(s) of these differences?

> Do you think your students develop study habits at university courses? i.e studying in advance, completing assignments, etc.
>
> Do you think that the courses they study at high school help them with university courses? Why / why not? Can you give examples?

Do you see any differences between the two groups in terms of their critical thinking and time management skills to university? If yes, describe the differences briefly. What could be the reason(s) of these differences?

> Do they demonstrate their strength at university?

Do you think your students' high school education provide them critical thinking skills? Could you give examples?

What is your perception of your students' time management of their coursework and responsibilities in your courses?

How successful do you think your students are at managing their time? Do you think their high school education helped to have better time management skills?

Thank you,

Are there any other things you would like to share related to our discussion today?

APPENDIX F: Ethics committee approval

Bilkent Üniversitesi
Akademik İşler Rektör Yardımcılığı

Tarih: 5 Şubat 2014

Gönderilen: Sıla Sagun

Gönderen: Cemal Yalabık
Provost Yardımcısı

Konu: *"Students' performance, skills and perspectives..."* çalışması etik kurul onayı

Üniversitemiz İnsan Araştırmaları Etik Kurulu, 5 Şubat 2014 tarihli görüşme sonucu, "*Students' performance, skills and perspectives on the combination between national and international curricula for university education in Turkey*" isimli çalışmanız kapsamında yapmayı önerdiğiniz etkinlik için etik onay vermiş bulunmaktadır. Onay, ekte verilmiş olan çalışma önerisi, çalışma yürütücüleri, ve bilgilendirme formu için geçerlidir.

Bu onay, yapmayı önerdiğiniz çalışmanın genel bilim etiği açısından bir değerlendirmesine karşı gelmektedir. Çalışmanızda, kurulumuzun değerlendirmesi dışında kalabilen özel etik ve yasal sınırlamalara uymakla ayrıca yükümlüsünüz.

Etik Kurul Üyeleri:

Ünvan / İsim	**Bölüm / Uzmanlık**	**İmza**
1. Prof.Dr. Cemal Yalabık	Fizik	
2. Prof.Dr. Sübidey Togan	İktisat	
3. Prof.Dr. Haldun Özaktaş	Elektrik ve Elektronik Müh.	
4. Prof.Dr. Tayfun Özçelik	Moleküler Biyoloji ve Genetik	
5. Prof.Dr. Erdal Onar	Hukuk	
Yd.1. Doç.Dr. Fatma Taşkın	İktisat	*(yedek üye)*
Yd.2. Doç.Dr. Süheyla Özyıldırım	İşletme	*(yedek üye)*

Kurul karar/toplantı No: 2014_02_05_01

APPENDIX G: Informed consent form

This informed consent form is for _____ University students and faculty members who we are inviting to participate in study titled "Students' performance, skills and perspectives on the combination between national and international curricula for university education in Turkey"

PhD candidate: Sıla Sagun
silas@blis.bilkent.edu.tr, +90 312 290 53 61
Organization: Bilkent University
Sponsor: International Baccalaureate Organization

This Informed Consent Form has two parts:

- **Information Sheet (to share information about the study with you)**
- **Certificate of Consent (for signatures if you choose to participate)**

You will be given a copy of the full Informed Consent Form

Part I: Information Sheet
Introduction

I am Sıla Sagun, studying at the Bilkent University. I am doing research on the exploration of the post-secondary outcomes of IB DP and non IB DP students in Turkish universities. I am going to give you information and invite you to be part of this research. You do not have to decide today whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research.

This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.

Purpose of the research

I would like to find out the differences between the performance and skills of students who have followed the national curriculum plus IB DP and students who have followed only the national curriculum. I will also try to explore the perceptions of the IB DP and non-IB DP students about their preparation at the secondary level for future university education. The difference in perceptions of faculty members about the students' performance and skills (critical thinking skills, time-management skills and students' sense of belonging to the university) will be analyzed.

Type of Research Intervention

The research will involve students' participation in an online questionnaire that will take about twenty minutes, one hour focus group discussion and one hour and a half hour critical thinking test. Individual interviews will be conducted with faculty members, which will take approximately twenty minutes.

Participant Selection

You are being invited to take part in this research because we feel that your experience as an IB DP/non IB DP graduate or a faculty member can contribute much to our understanding and knowledge of our research focus.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. If you choose not to participate all the services you receive at this university will continue and nothing will change.

Risks

You do not have to answer any question or take part in the discussion/interview/questionnaire if you feel the question(s) are too personal or if talking about them makes you uncomfortable.

Benefits

There will be a direct benefit to you, which is getting your critical thinking test score from SHL company free of charge (for students). Besides that your participation is likely to help us find out more about the post-secondary outcomes of IB DP students in Turkish universities

Confidentiality

We will not share information about you to anyone outside of the research team. The information that we collect from this research project will be kept confidential. Instead of using your name a number will be assigned to you, and any reference made will be made to the number.

Who to Contact

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact Sıla Sagun, silas@blis.bilkent.edu.tr, + 90 312 290 53 61

This proposal has been reviewed and approved by Bilkent University ethics committee, whose task it is to make sure that research participants are protected from harm.

Part II: Certificate of Consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been

answered to my satisfaction. I consent voluntarily to be a participant in this study

Print Name of Participant_____

Signature of Participant _____

Date _____

Day/month/year

Statement by the researcher/person taking consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:
I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this ICF has been provided to the participant.

Print Name of Researcher/person taking the consent__Sıla Sagun

Signature of Researcher /person taking the consent_____

Date _____

Day/month/year

*** WHO's informed consent form for research template is used and manipulated.**

APPENDIX H: The common courses selected for the calculation of the average of the scores (Turkish, English, mathematics, chemistry and physics)

	University courses' titles				
	Turkish	English	Mathematics	Chemistry	Physics
University 1 (Foundation)	TURK 101, TURK 102	ENG 101, ENG 102	MATH 101, MATH 102, MATH 105, MATH 106, MATH 119	N/A	PHYS 101, PHYS 102
University 2 (Public)	N/A	ENG 101, ENG 102	MATH 117, MATH 119, MATH 120, MATH 125, MATH 126	CHEM 101, CHEM 102, CHEM 105, CHEM 106, CHEM 107, CHEM 111, CHEM 112	PHYS 101, PHYS 105, PHYS 106, PHYS 109, PHYS 110, PHYS 111, PHYS 112
University 3 (Foundation)	N/A	N/A	MATH 101, MATH 102, MATH 106, MATH 107	CHEM 102, CHEM 103	N/A
University 4 (Foundation)	N/A	N/A	N/A	N/A	N/A

VITA

Sıla Sagun was born in Ankara, Turkey on February 25th, 1985. She has a BSc degree in Biology from Ankara University, and an MA in Biology Teacher Education from Bilkent University. In 2009, Sıla entered Bilkent University Graduate School of Education in order to earn a Doctor of Philosophy degree in Curriculum and Instruction. She has been working as a middle school science and high school biology teacher at Bilkent Laboratory and International School (BLIS), Turkey since 2009. She has been teaching IB biology both standard level and higher level and IB environmental systems and societies. She has worked as an IB biology assistant examiner. She worked as grade level coordinator and a subject leader at BLIS. She is currently the head of the science department and the programme leader of Cambridge Professional Development Qualifications in Teaching and Learning.