Faculty Beliefs and Needs: Opening the Gate to ICT-based Professional Development in Teaching and Learning

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ABSTRACT

Globalization, competitiveness, and the need for competent human resources are the main factors which have sped up efforts to maintain and increase quality in higher education throughout the world. Although quality education is the result of a number and variety of components, teaching faculty has a major and determining role. The need for professional development arises as members of faculty are often not trained in teaching. This necessitates ICT-based faculty professional development approaches which are flexible learning environments and offer many advantages for sustainable faculty growth.

Emerging quality concerns in higher education institutions in North Cyprus will lead to professional development issues in the very near future. Consequently, there is an urgent need for research on faculty needs and beliefs in teaching, learning, professional development, and ICT-based approaches.

The purpose of the present study is to explore faculty's professional development needs and beliefs in one of the leading higher education institutions in North Cyprus, namely, the Eastern Mediterranean University.

The study will investigate the needs of faculty as regards professional development in teaching and learning. In addition, it will look into their beliefs in professional development in teaching and learning and about ICT-based learning opportunities for professional development in teaching and learning. Using the collected data, a comparative study will be done to determine whether the faculty's needs in teaching and learning vary depending on their demographics and their beliefs.

This research study will use quantitative research methodology. The collected data will be stored and analyzed using computer-assisted quantitative data management and analysis tools.

The research study thus aims to deliver findings that may be helpful for designing a faculty-centered professional development framework in the future.

Keywords: Faculty development, professional development, beliefs, higher education, educational technology, teaching and learning, needs assessment.

ÖZ

Tüm dünyada yüksek öğrenim kurumları küreselleşme, rekabet ve yetkin insan kaynaklarına gereksinim gibi güncel nedenlerden ötürü kalitesini sürdürmek ve arttırmak amacıyla çalışmalarını hızlandırmıştır. Her ne kadar kaliteli eğitimin birçok farklı boyutu olsa da, bunlardan en önemlisinin öğretim elemanları olduğu yadsınamaz. Ancak genelde öğretim elemanları öğretme ve öğrenme konusunda eğitim görmedikleri için bu konuda profesyonel gelişim gereksinimi ortaya çıkmaktadır. Bu durum daha esnek bir öğrenme ortamı yaratan ve öğretim elemanlarının gelişimine süreklilik kazandıracak bir Bilgi ve İletişim Teknolojisi (BİT)-tabanlı profesyonel gelişim gereksinimi doğurmaktadır.

Kuzey Kıbrıs yüksek öğrenim kurumlarının son günlerde hızla artan kalite çalışmaları yakın bir gelecekte profesyonel gelişime ilişkin konuları tetikleyecektir. Bu nedenle, ivedi olarak öğretim elemanlarının öğretme, öğrenme, profesyonel gelişim ve BİT-tabanlı yaklaşımlara gereksinimleri ve inançları konusunda araştırmalar yapılması gereklidir.

Bu çalışmanın amacı Kuzey Kıbrıs'ın önde gelen yüksek öğrenim kurumlarından Doğu Akdeniz Üniversitesi öğretim elemanlarının öğretme ve öğrenme konusundaki gereksinimlerini ve inançlarını saptamaktır. Araştırma, öğretim elemanlarının öğretme ve öğrenme konusunda gereksinimlerini soruşturacaktır. Bunun yanında, öğretme ve öğrenme konusunda profesyonel gelişim ve BİT-tabanlı öğrenme olanakları konusundaki inançlarını tesbit edecektir.

Toplanan verilerle karşılaştırmalı bir çalışma yapılarak, öğretim elemanlarının gereksinimlerinin demografik çerceve ve inançlarına bağlı olarak değişip değişmediği saptanacaktır. Bu nicel bir araştırma olup, veriler veri yönetimi ve analizi yapan uygulama programları ile çözümlenecektir.

Bu çalışmanın sonucunda elde edilen bulgular ileriki dönemlerde olası bir öğretim elemanı merkezli profesyonel gelişim çatısının tasarımı için yardımcı olabilecektir.

Anahtar Kelimeler: Öğretim Elemanı Gelişimi (yetiştirme), Bilgi ve İletişim Teknolojileri, BİT, Öğretme ve Öğrenme, Yüksek Öğrenim, Teknoloji Destekli Eğitim, Erişkin Eğitimi.

This study and my doctoral degree are dedicated to all my family, relatives, friends, neighbors, teachers, and students who, in one way or other, enlightened me during the initiation, planning, designing, and implementation of this once-in-a-lifetime process.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

The beginning of the 21st century marked the gateway to the knowledge era and digital age. The knowledge era can be defined as the transition of learning from 'data' facts, to 'information', organized data, and finally to 'knowledge', dynamic information which is derived from experience. The digital age commenced with the rapid development of Information and Communication Technologies (ICT) in the home and at the workplace, which, in turn, gave rise to their use in addition to connecting everyone digitally. The changing views of the nature of knowledge (Duke, 2002) and the quality of knowledge generated within higher education (World Bank, 2000) increases global commitment to education. This commitment, in its turn, pushes the higher education sector which is preparing the human power for the world to revise its systems.

Quality is the main challenge of all higher education institutions to catch up with the knowledge era and the digital age. Globalization, competitiveness, contemporary changes, and the need of competent human resources are some of the reasons which have sped up the efforts to maintain and increase quality in higher education throughout the world.

Professional development and the use of technology are essential educational factors to enhance institutional quality. To keep pace with this century, there is a need to

embrace innovative ways to enhance quality, incorporate new findings about learning, and develop high quality faculty to establish and implement these innovations. These will all add value to the higher education institutions.

1.1 Challenges in Higher Education

Globalization in higher education is an important aspect since education is being shaped by global processes. Global economic and political changes force countries to standardize their educational systems in terms of quality education. Quality will ensure that different higher education institutions can exchange students, and can obtain desired outcomes in terms of students with similar professional levels. UNESCO emphasizes the value of internationalization: "Quality also requires that higher education should be characterized by its international dimension: exchange of knowledge, interactive networking, mobility of teachers and students, and international research projects, while taking into account the national cultural values and circumstances" (UNESCO, 1998, Article 11 b).

One of the main reasons for seeking quality is competitiveness within and among higher educational institutions. During the last century, demand for higher education grew rapidly all over the world. There is an increasing number of students in universities, within campuses and globally scattered. Higher education institutions, especially in Western countries, are trying to attract more students from other parts of the world. These efforts are competitive in that higher education institutions are trying to be among the best globally recognized universities to attract more new students and to satisfy the needs and expectations of current ICT-dependent students and graduate students equipped with 21st century skills (Ellis, 1993; Fallows & Bhanot, 2005; Sorcinelli, Austin, Eddy, & Beach, 2006). On the other hand, efforts

towards quality are also collaborative, like a relay race, where institutions are expected to pool their knowledge bases to exchange students and academic staff for teaching and learning besides research purposes. In this situation, distinction from other universities is only possible by improving the quality of education which will impact quantity of students.

Duke (2002) explains the nature and significance of the number of changes facing institutions of higher education. An important aspect of these changes is the number and variety of students. On one hand, the demographic structure of teenage students is changing while the philosophy of lifelong learning has increased the number of adult students on the other. Sorcinelli et al. (2006) mention the increase in female, multicultural, and minority students in universities. They also indicate that, besides demographics; students' different learning styles, needs, interests, and levels of commitment need to be fulfilled by universities. Another change is in the teaching/learning environments which are influenced by new technologies (Nicholls, 2001). The use of face-to-face learning environments started to decrease with the emergence of e-learning opportunities. In addition, blended environments offer both and are more flexible. With the increase of the Internet communications, informal learning environments are escalating versus formal learning environments and virtual learning environments are gaining precedence over physical ones.

It is not only the students' demographics that are changing, but also the demographics of faculty. There is an increase in the number of members of faculty at the retirement age which is placed with new faculty (Sorcinelli et al., 2006). In addition, the

population of faculty does not increase in proportion to the increase in the number of students (Fallows & Bhanot, 2005).

Universities are the origin of well-educated and technologically equipped human resources for their country in particular and for the world in general. The improvement in the quality of higher education institutions means the improvement in the quality of graduates for industry, education, and all other sectors. All these facts about higher education institutions trigger the quality concerns from the national to the international arena to cope with both internal and external changes.

1.1.1 Quality in Higher Education

In the 21st century, higher education institutions all over the world are giving the utmost importance to quality in order to overcome changes. Quality, by definition, is standards and the achievement of better products. While Ellis (1993) emphasizes 'meeting standards' and 'excellence', Fallows and Bhanot (2005) associate quality with terms such as 'assurance', 'enhancement', and 'development'.

The mission and vision of many higher educational institutions mention excellence, enhancement, and development which bring up the concept of quality. "Quality in higher education is a multidimensional concept, which should embrace all its functions, and activities: teaching and academic programmes, research and scholarship, staffing, students, buildings, facilities, equipment, services to the community and the academic environment" (UNESCO, 1998, Article 11 a). Ellis (1993) defines 'quality teaching' in universities as implying excellence which will meet teaching standards to satisfy the needs of the students, thus promoting learning.

According to Fallows and Bhanot (2005), it must be 'fit for the purpose' in order to meet the expectations of 21st century ICT-dependent students.

Academic quality efforts in the field of higher education in the USA were triggered by the Carnegie Commission Policy Reports (1968) resulting in instructional improvement programs of universities in the 1970s (Eleser & Chauvin, 1998). In the late 1980s in the UK, quality was emphasized because of the increasing number of students without change in physical and staff resources (Fallows & Bhanot, 2005). The establishment of the European Union (EU) in 1993 also sped up the process of improving quality in European universities. The increasing number of students and programs created a quality concern in European higher education systems, mainly in order to satisfy the expectations of students, the adoption of mobility, and to satisfy the needs of the society (TÜBİTAK-BTPD, n.d.). Also there are new expectations from higher education in the world and in Turkey (YÖK, 2006). Now students of all ages have learning opportunities and training possibilities throughout the EU (PLOTEUS, n.d.). ERASMUS (2006) projects enable the exchange of students within the EU. Member countries are also working to harmonize and accredit their higher education systems for increasing mobility of students and staff in Europe through the Bologna Declaration (1999) process.

In addition to the efforts of nations, international organizations are also doing projects and preparing reports to stress the importance of quality in higher education. The World Bank (2000) has prepared a report, entitled 'Higher Education in Developing Countries', to consider revising higher education systems to produce 'larger and better trained pools of graduates and research of higher quality'.

UNESCO and the OECD have also prepared guidelines on 'Quality provision in cross-border higher education' (UNESCO, 2003) to specify the accreditation standards for quality and mobility, which give universities an opportunity in different parts of the world to be evaluated in terms of program quality.

All these quality efforts bring up quality concerns in the strategic plans of all higher educational institutions with a forthcoming change in objectives, mission, and vision statements. Institutions are expecting these efforts to make a real difference and transform them into learning organizations to compete in the global education arena. Duke (2002, chap. 6) defines a learning university as an organization that continuously adjusts to new circumstances and explores new opportunities by changing itself. Enhancement and development efforts for quality are naturally the triggers of change in institutions. Within a number and variety of components that will facilitate change, the faculty has a major and determining role where 'quality education' is emphasized.

1.1.2 Role of Faculty in Attaining Quality

In order to improve the quality of an institution, the commitment and contribution of the academic staff, one of the major actors of the academic system, cannot be neglected (Duke, 2002; Ellis, 1993; Elton, 1993). Sorcinelli et al. (2006) highlight that faculty who are at the heart of their institutions dedicate their lives to research, teaching, and service. In place of service, Blackmore and Blackwell (2003) mention administrative responsibility. Duke (2002, chap. 6) enumerates additional faculty roles as advising, counseling, and developing various skills such as study, library, and information technology.

Faculty members are expected to learn, reflect upon, and then practice rapid changes in technology, changes in specialization and discipline, as well as innovations in teaching and learning. Faculty's individual efforts may not be sufficient, so they have to work with others. Collaboration and communication within academic staff (Duke 2002, chap. 6) and with other staff (Elton, 1993) is essential for quality enhancement. Committed and dedicated faculty in a supportive working environment will facilitate change (Diamond, 2002). Faculty members need to develop themselves professionally in the variety of roles they undertake to implement changes and improve educational quality.

Among all their responsibilities, professional development is often overlooked. Since the faculty intrinsically concentrates on development in their research and service responsibilities, development in teaching and learning tends not to be well planned. Movement towards quality necessitates change in teaching and learning in academia. This can be realized by education which is considered as a lifelong and sustained process resulting in continuing professional development and continuing professional development among faculty is vital for quality in higher education.

1.2 Faculty Professional Development

Development is a process in which individuals move on to a more advanced stage in phases. This can be achieved by learning new content or by improving one's skills. Professional development is defined as the development of a person in his or her professional role, mastering and maintaining a knowledge base related to that profession (Blackmore & Blackwell, 2003; Schwandt & Tobin, 1999; Villegas-Reimers, 2003).

Cervero (2001) emphasizes the importance of professionalization in workforces in the 21st century. The initial pre-service professional education which consumes a lot of financial and human resources is not sufficient over the course of lifelong employment because of technological innovations, social changes, and the need to keep one's knowledge base up-to-date. Cervero has analyzed development in continuing professional education from the 1980s until the beginning of the 21st century. Continuing professional education programs started in 1962 for doctors of medicine and in the 1980s broadened for other professions: engineering, accounting, civil services, medicine, librarianship, nursing, management, and public school education. Based on this analysis, he found that, in the 21st century, businesses, hospitals, social service agencies, and government are sectors that offer intensive professional education to their employees. The major providers of professional education are universities and professional schools. Others are professional associations, workplaces, and independent for-profit organizations. Even though Cervero criticizes the continuing education system for being still primitive since there is an approach to inform practitioners about the latest updates using traditional teaching methods and since it is offered by 'pluralistic' groups of providers such as workplaces, for-profit organizations, associations, and universities who do not collaborate with each other.

Although universities and schools have been main professional education providers, the history of professional development was more focused on professions other than teaching (Leach, 2005). However, in the past years, literature review reveals greater emphasis on in-service training and continuing professional development (Özer, 2004). Research findings assessing pre-service teachers' level of anxiety show that

the senior students' major anxiety is more focused on professional task than student (Saban, Korkmaz, & Akbaşlı, 2004). However, Elton and Patington (as cited in Elton, 1993) question whether those who teach in universities can be called professionals since most faculty in higher education are usually not trained as teachers (Layne, Froyd, Simpson, Caso, & Merton, 2004). As a result, Elton (1993) claims that university teachers' lack of training is an obstacle for them to maintain quality criteria in their profession.

Since education is one of the main focuses of higher education institutions, achieving high educational quality or quality education remains an important concern. In educational process quality, the role of customers and consumers reveals the importance of students and teaching staff in higher education (Ellis, 1993). UNESCO's (1998) 'World Declaration on Higher Education for the Twenty-First Century' vision and action report 'Higher education personnel and students as major actors' emphasize the role of faculty:

> "A vigorous policy of staff development is an essential element for higher education institutions. Clear policies should be established concerning higher education teachers, who nowadays need to focus on teaching students how to learn and how to take initiatives rather than being exclusively founts of knowledge. Adequate provision should be made for research and for updating and improving pedagogical skills, through appropriate staff development programs, encouraging constant innovation in curriculum, teaching and learning methods, and ensuring appropriate professional and financial status, and for excellence in research and teaching…" (Article 10)

Faculty cannot be considered as professionals since university instructors are not trained as teachers, and this may be an obstacle for them to practice a profession in order to maintain quality criteria (Elton, 1993) although Nicholls (2001) claims a change in academicians' vision who previously did not consider themselves as professionals. He defines professional development as a dynamic process from preparation and orientation to completion and retirement over one's career. Development has gained great importance through the rise of quality concerns in higher education. Institutions have to give faculty a chance to develop themselves (Ellis, 1993; ENQA, 2005) by realizing the value they add to the institution.

This raises the urgent need for professional development where it not only serves the purposes of the institution, but also supports individual staff through lifelong learning (Blackwell & Blackmore, 2003, Preface). Higher education institutions should be responsible for considering their services in order to contribute to changes in the society and emphasize the professional education of faculty (Caffarella & Zinn, 1999; Odabaşı, 2005). These arguments show that to improve quality, the responsibility for professional development is shared between the higher education institutions and individual faculty members.

Professional development can be either formal – in the form of research, publications, workshops, conferences, accessing online resources, mentoring, project-based work, keeping a reflective journal, working with an educational (instructional) designer, or informal – conversations with colleagues, reading, receiving informal feedback, being mentored, networking (Sherer, Shea, & Kristensen, 2003). Both formal and informal professional development can be further

categorized as collaborative/collegial and individual activities (Ferman, 2002). Caffarella and Zinn (1999) categorize continuing professional development in three groups: self-directed learning experiences, formal professional development activities, and organizational development strategies.

The importance of professional development, through either individual or institutional efforts, has been increasing and going through various stages to improve quality in education. Camblin and Steger (2000) claim that faculty development has, for a long time, been integrated into higher education strategies for faculty 'self-renewal' and 'increased vitality'. Higher education faculty development started to appear in government policies and was supported by various institutions such as higher education councils, universities, and faculties.

1.2.1 History of Faculty Development

In higher educational systems, a variety of names are globally used with minor differences in meaning to refer to professional development of university academics: *staff development, educational development, instructional development, academic development,* and *faculty development* (ICED, 2006). The Professional and Organizational Development (POD) Network established in 1975 considers three main areas to support the developmental needs of higher education staff: faculty development, instructional development, and organizational development (POD, 2007). Diamond (2002) points out great overlaps among these three areas and adds that professional development covers both faculty and instructional development. POD views the development of faculty in a holistic approach as teachers, scholars and professionals, and finally as individuals. "A holistic approach is one which acknowledges the needs of individuals and the collectivities in which they operate,

recognizes the need for personal, professional, and organizational development and accepts the changing nature of all work roles" (p. 19), as defined by Brew and Boud (1996).

Although faculty development has always been well thought out, efforts were limited until the 1960s. During the last 40 years faculty development purposes have changed (Kisner et al., 1998), new approaches have been developed (Gillespie, 2002, Preface; Sorcinelli et al., 2006), and new dimensions and directions have been given (Nicholls, 2001). In their book, Sorcinelli et al. review the history of faculty development and its growth as a profession. They present five faculty development stages in chronological order from the 1960s, changing nearly every ten years. They start with the age of scholar, continue with the age of teacher, the age of developer, the age of learner, and finally call the new millennium the age of network. Within this chronology, faculty development stages transform faculty members from teachers to learners and most recently to collaborators. The age of network needs collaborative efforts by all the stakeholders in the higher education system. This is an effort to satisfy the cumulative expectations of faculty, faculty developers, and institutions.

In the 1970s 'faculty development' started to incorporate a selection of practices and particular programs (Centra, 1976) and in the 1980s, it started to grow more as a professional field (Sorcinelli et al., 2006). From 1990 onwards, faculty development moved beyond national boundaries to become a global concern. International organizations such as the Staff and Educational Development Association (SEDA)

and the International Consortium for Educational Development (ICED) started to make unified efforts (Sorcinelli et al., 2006) to eliminate borders within education.

In the past, faculty development initiatives were most focused on academic research in a discipline, now being enhanced with workshops, seminars, training, and programs directed at teaching and learning effectiveness and educational technology (Lawler & King, 2000). In 2003, Odabaşı (2005) states that faculty development is a new concern in Turkey where Özer (2004) snapshots the current situation of increasing awareness in faculty development. Kisner et al. (1998) point out that the future is in cooperative professional development with peer support.

New models are developed to enhance competences, connections, collaborations, and communications (Lally & McConnell, 2005). Faculty development models in the 'digital age' (Moxley, 2000) or the 'age of network' (Sorcinelli et al., 2006) aim to set up flexible and technology-enhanced lifelong learning environments for faculty.

1.2.2 Continuing Professional Development

Development by meaning is an incremental, gradual, and spiral sustainable process which needs lifelong improvement. In this process, one of the major goals of successful teaching and learning is to make lifelong learners of individuals. Since professional education should be sustained, it requires the ability to continue a defined behavior indefinitely. Sustained development for professionals is referred to as Continuing Professional Education (CPE) in some literature (Cervero, 2001) and as Continuing Professional Development (CPD) in others (Caffarella & Zinn, 1999; Chen & Chen, 2002; Clegg, 2003; Davies & Preston, 2002). Caffarella and Zinn (1999) note that throughout the career path, continuing professional development is

the only way to achieve both personal and institutional goals. Cervero (2001) asks whether higher education institutions that provide a considerable number of continuing education opportunities to professionals external to the institution provide similar services to their own academic staff.

Various structures like faculty centers, teaching and learning excellence centers, committees, certificate programs, faculty learning communities, and communities of practice are used to manage continuous faculty development activities. Professional development centers are established either as academic units or as administrative units. They design and develop programs in teaching, learning, research, and leadership in the form of seminars and workshops, and other services include mentoring, consultations, and technology support (Shephard, 2004). Some new administrative and academic professions are also set up and are connected to these centers (Harland & Staniforth, 2003; Stanley, 2001). All these new structures formed for the professional development of faculty aim to establish formal sustainable development.

The rapid development of technology resolves the time, place, and financial constraints of continuous learning. In higher education, professional development relates to various types of learning: life-long learning, organizational learning, or discipline-based learning (Nicholls, 2001). Layne et al. (2004) suggest making faculty development into an 'ongoing' activity. Solomon and Schrum (2007) comment that adults need a model to 'meet them where they are' rather than 'one size fits all'. This can be possible by using technology for continuous faculty development.

Nowadays, in addition to higher educational institutions, national governments as well as international organizations such as UNESCO, the OECD and the World Bank are preparing strategies and supporting sustainable development for higher education professionals. Sustainability is made possible by creating a framework that will allow faculty and institutions to evaluate the program and effectiveness of the faculty development activities, and to provide feedback.

1.2.3 Sustainable Professional Development

In the 21st century, most higher education institutions have established professional development centers for supporting faculty. 'Helping academic staff to help themselves' (Shephard, 2004), which is the main theme of professional development, works better than giving direct support by doing the work for them. Professional development centers are for empowering professional improvement opportunities like conferences, seminars, workshops, and online education for the development of faculty in teaching, research, and technology. Various names are used for these professional development centers in the universities, for example, Center for Professional Development, the University of Auckland; Faculty Development Center, Eastern Michigan University; Center for Faculty Development, San José State University; Professional Development Center, University of Toronto.

In some universities these professional development centers are established as academic units and in others as administrative or support-services units (Shephard, 2004). They develop continuing professional development programs in teaching, learning, research, and leadership such as seminars and workshops. These types of programs are traditional professional development activities in training trainees. Shephard adds that recently many institutions have already developed accredited

professional development programs. To meet the teaching, learning, and research needs of the faculty, other services are also offered such as reviewing of teaching portfolios, teaching consultations, and instructional technologies. Faculty from different disciplines benefiting from academic support and professional development services engage in teamwork to improve their teaching outcomes using different areas of expertise. Referenced in literature are some administrative and academic professions that have recently emerged from professional development centers, to list a few, directors, professional developers, educational developers, faculty learning and teaching coordinators or faculty developers, who are experts at working with faculty on teaching and learning issues in higher education (Stanley, 2001), and academic developers, who are more research-oriented (Harland & Staniforth, 2003).

Universities are now forming learning communities and networks for collaborative professional development as a way to create links among professionals, using ICT. 'Faculty Learning Communities' (FLCs) create an environment for colleagues to meet regularly, participate in activities to enhance their learning, and share their experiences (Layne, Froyd, Morgan, & Kenimer, 2002; Sherer et al., 2003). FLCs are given various names in different institutions such as 'faculty learning group', 'faculty inquiry group', 'faculty study group', or 'teaching circle' (Sherer et al., 2003).

Faculty professional development should be designed and organized based on the learning preferences and theories of faculty members. It should also consider the differing schedules and workloads of the faculty to ensure they have time for learning.

1.2.4 How Faculty Learns?

There are many professional learning theories to frame the basis of faculty learning. Most of these theories are based on John Dewey's theories to improve the quality of learning and teaching of academics (Nicholls, 2001). Dewey emphasizes learning in a social context, active engagement, and reflection to improve learning. His theories found support in all levels of education, including professional development. Effective professional development is a complex process. First the members of faculty are all different from each other in learning style, experience, and preference for teaching approaches. Besides they may learn and think of good practices but they can not associate with classroom implementation. Guskey (2000) also asserts that the relationship between professional development and students learning is complex, dynamic, and multi-factor. He suggests that professional development will focus exclusively on learning and learner where student learning goals should be clearly expressed.

Although they are different from each other in many ways, their common feature is being adults. Many faculty professional development programs are therefore based on adult learning theories (Lawler & King, 2000). Most common is Malcolm Knowles' adult learning theory (1984). According to Knowles, adults are self-directed and their needs, beliefs, prior experience, different learning styles, and different developmental stages need to be considered in learning activities. Wilde (1996) adds that interactive and hands-on work is suitable for adult learning. As adults, they should also be involved in planning and implementation (Kisner et. al, 1998). This gives them motivation and engagement to develop professionally through individual effort.

Lawler and King (2000) emphasize that the issue of faculty development is rarely supported by the theory and practice of adult education, adult learning, and adult development. From this perspective, they developed 'The Adult Learning Model of Faculty Development'. Professional development programs are designed with a consideration that the participants are adults and are placed in the center of learning process in order to be successful. In the 'Learning Centered Education Model', Hubball and Poole (2003) stress that adult learning is both an individual and a social process and use this as a basis to their model.

Experiential learning is an educational approach that focuses on 'learning by doing'. The learners take part in direct experiences that will help them practice and reflect. David A. Kolb's model of experiential learning can be found in many discussions of the theory and practice of adult education, informal education, and lifelong learning. Kolb's professional learning model is used largely outside education where different learning styles are considered. Lally and McConnell (2005) suggest faculty developers to participate in networked events in ICT-based teaching and learning environments in order to take advantage of experiential learning opportunities. Faculty will surely benefit from using experiential learning for their professional development.

Layne et al. (2004) define "As understood within a constructivist paradigm, faculty members construct their own theories of learning, assessment, and teaching." (p. 16) Teacher education programs start changing and developing constructivist programs which make 'program development an ongoing and emergent process' (Rainer, 1999). Wilde (1996) writes of five professional development principles and proposes

a constructivist approach through which faculty can link new information to their existing knowledge and skills, finally constructing their own meaning. Constructivist learning environments are more suitable for faculty since they can be flexible in their learning time, place, and pace. In the 'age of network' Sorcinelli et al. (2006) state that faculty, academic leaders and faculty development should connect, communicate, and collaborate with each other. Daley (2003) compares a traditional professional development program with a learner-centered program that facilitates learning. Although higher educational institutions are aiming at learner-centered education and learning-centered teaching in the knowledge era, learning-centered faculty development activities rarely exist (Froyd, Fo, Layne, & Simpson, 2005).

Theories of learning are currently changing. Situated learning, based on the research of Jean Lave in 1990, considers the learner as an individual who participates in social and cultural environments with learning objectives (Solomon & Schrum, 2007). Social interaction and collaboration are the main components of situated learning. In 1987, Boyer, who served as the president of the Carnegie Foundation, said he believed that a model of community of learning created in universities will unite faculty, staff, and students as a whole (McDonald, 1958). Communities of Practice (CoP), a term first used by Lave and Wenger in 1991, emphasize the social dimension of learning. People have a shared set of interests and motivations to do something, in other words, knowledge management and distributive collective work (Wenger & Snyder, 2000). When learners are involved in CoP, they acquire certain beliefs and behaviors about learning which are usually unintentional. This model is based on the work of Vygotsky and Dewey. Randall (2008) praises situated learning by commenting, "When faculty members have opportunities to apply their new

pedagogical skills in the context of their curriculum, the transfer of theory into practice is greatly increased." (p. 19).

Connectivism is also one of the recently discussed learning theories of the digital age (Kop & Hill, 2008). Siemens (2004) argues that learning is not only under the control of an individual, knowledge can also be stored in non-human appliances, and access to what is needed is more important than what is acquired. Lally and McConnell (2005) advocate that faculty networked group learning is important for pedagogical reasons, and participation in events facilitates experiential learning.

These theories have in common the fact that members of faculty, as adults, may prefer to learn when they want, as they want, and at the pace they want. They also prefer to build their learning on their previous knowledge, skills, and experiences in a connective, communicative, and collaborative way within their peer network. Faculty should keep in mind that their learning approaches are not so different than the students' learning styles (Knight, 2002). Their professional development will eventually occur as a concequence of their learning.

1.3 Statement of the Problem

Higher education has an important role in shaping the future development and ultimately the recognition of North Cyprus, which can be considered as an 'education island'. North Cyprus has seven universities, including an open university, and a total of 40,000 students pursuing undergraduate and graduate studies in these institutions (Bıçak, 2011). The universities are all international, where 67.5% of the students are from Turkey, and 7.5% are from other countries, mainly from Nigeria, Iran, and Pakistan (Bıçak, 2011).

Quality assurance in these universities is a very important issue since professionally equipped and technologically ready graduates are expected. Also, most of the foreign students consider their undergraduate education in North Cyprus as a bridge to further graduate studies in European Union (EU) countries, the USA, and Canada. The creation of a good quality bridge is possible by improving educational quality. The other rationale for focusing on quality is the North Cypriot government's willingness to become a member of the EU in the near future. For this reason, some of the universities in North Cyprus have already joined or are in the process of joining the European Universities Association (EUA).

In order to support the quality issue, the government of North Cyprus has a 'Higher Education Planning, Organization, Auditing, Accreditation and Coordination Council' [Yükseköğretim Planlama, Denetleme, Akreditasyon ve Koordinasyon Kurulu] (YÖDAK). Established on 26 October 2005, YÖDAK is charged with the mission of identifying goals, supporting planning, organization, controlling, accreditation and coordination of rules and regulations in the higher education sector in North Cyprus. The emergence of educational quality efforts by the EUA, the Ministry of National Education, Youth and Sports, YÖDAK, and the universities in North Cyprus cannot be ignored. YÖDAK established a council of representatives from higher education institutions (YÖDAK, 2005). Quality was defined and reported to be the primary concern in the Higher Education Workshop organized by YÖDAK in October 2006. The World Bank prepared an economical report which included the educational status of North Cyprus commenting on the inadequacy of quality (World Bank, 2006).

Since then, efforts to attain quality in higher education of North Cyprus have been given the utmost importance. The institutions have started initiatives under the umbrella of YÖDAK for quality education, either in collaboration with EU organizations or individually. Many departments obtained accreditation for their programs from international accreditation bodies and others are heading in the same direction. Such initiatives will likely help in the following important aspects: the recognition of North Cyprus universities internationally; achieving quality to fulfill the needs of international and local students; developing faculty to attain international quality in teaching and learning as well as research; and, the last but not the least, improving the social and economic status of North Cyprus to which the education sector makes a valuable contribution.

Once the mission was defined as educational quality, faculty as one of the important contributors to quality became more emphasized. The current status of faculty and how to improve quality are important concerns. Innovations in technologies and the roles of students and teachers in the 21st century bring new approaches in teaching and learning, which are significant roles of faculty. The faculty needs to be aware of these approaches and change their practices accordingly. At this point, continuing professional development is expected to trigger such changes.

Faculty members being lifelong learning adults, better success is anticipated by faculty designing their own learning in a bottom-up approach. Faculty's attitudes, beliefs, concerns, goals, and perceptions about professional development are to be considered for developing effective professional development programs based on learning theories (Eleser & Chauvin, 1998; Johnson et al., 1998). In order to develop

faculty competence in teaching and learning, their needs have to be determined. Their beliefs about professional development in teaching and learning are also very important since beliefs may form a barrier to their learning and practices. If beliefs are known, these may be utilized to make faculty aware of them in order to drive change.

ICT-based teaching and learning approaches may be more suitable for faculty in the 21st century. Within a flexible technology-enhanced learning environment, they can develop themselves anytime, anywhere, at any pace, and using any media. Their beliefs, if known, can be used to set up a specific ICT-based learning environment for faculty to progress. Faculty development that meets the requirements of faculty is expected to be successful.

Eastern Mediterranean University (EMU), one of the largest universities based on population, with 14,444 students and 600 full-time academic staff members can be considered as representative of North Cyprus universities. Within students 9% of faculty and 24% of students of EMU are from overseas excluding Turkey (Altınay & Ezel, 2011). In previous years, EMU launched quality issues using the themes 'Aiming for the peak of quality' and currently 'For your international career'. As the European University Association (EUA) team (2007) reported in their accreditation review report for EMU, there are significant efforts expanded towards internationalization.

The intensive quality efforts beginning in the year 2004 yielded some discrete efforts for professional development in EMU. These started with collecting teaching portfolios for faculty evaluation in 2003-2004 by PAI-DEK (Performance, Academic

Advancement and Evaluation Council) where initial data results are still presented in EMU academic portal. No sanctions were applied as a result of these evaluations. In the strategic plan of 2005-2010, it was suggested to set up a 'Center for Excellence in Teaching' and a 'Center for Instructional Development'. These centers aimed at developing quality in instruction and mechanisms to standardize grading policies (Pillai, 2004). All academics holding a Ph.D. were asked to fill in PDS (Personnel Data Summary) forms to summarize their activities so that teaching loads would be distributed in accordance with the results of this assessment. Although these centers could not turn into reality, a different one, 'Learning, Teaching and Assessment Center' (LTAC) was established by University Executive Board in 2005 (LTAC, 2005). Their aim to improve the quality of instruction in EMU was similar to those suggested earlier, while they also intended to create an environment to discuss and develop ideas in teaching, learning, and assessment. Within the one year that it was active, the center was not able to perform that much. They published a newsletter to guide faculty to write 'learning objectives' in their courses, some articles and some links for resources on new teaching and learning approaches.

In addition to these institutional efforts, there were some departmental efforts. The School of Tourism and Hospitality (THM) arranged seminars for faculty members to inform them about new educational approaches. The presenters were selected from educational faculty members by the THM school director. Not surprisingly, the topics were either suggested by the director or by the presenting faculty. Thanks to good intentions and personal striving, four or five seminars were organized.

Faculty also engaged in numerous unintended development endeavors. The accreditation processes are one of these (Mehtap-Smadi & Hashemipour, 2011). The programs that have gained accreditation from the USA, Europe, and Turkey are the Faculty of Engineering (ABET), the Faculty of Architecture (MIAK), the Schools of Computing and Technology (ASIIN) and of Tourism and Hospitality Management (TEDQUAL). Those faculty who take part in accreditation committees are learning about the teaching and learning process and curriculum updates. They can also attend conferences and workshops, which is part of the regular institutional working structure of the Research Advisory Board. In these organized events, they have the chance to develop teaching and learning within their particular discipline since they are able to attend sessions, workshops, or panels.

Considering the work done for the professional development of faculty, the following is observed. These efforts are scattered in bits and pieces. There is no institutional approach since the design, development, and control is from top-down. There is no systematic approach to faculty development in teaching and learning. As a result, there is no continuity where a change in administration or management can affect the efforts. There is no communication and coordination among the different faculties, schools, and departments. Although some units are planned and established in different time frames, they are not active. It can be thought that faculty needs may not be considered and satisfied as a consequence. Even the activities that are held may need to respond to what they are in need of, since there was no prior needs assessment done.

It is expected that increased quality efforts will enrich faculty development opportunities. However, there are still very limited recognizable faculty development initiatives. Especially what has been done until now, did not consider faculty members' individual needs at all. Thus formalizing and prioritizing personal observations is required since there is no institutional evaluation. The present study aims to contribute to professional development and to improve it. In order to improve service qualities EMU provides to the faculty members, the current status should be investigated by identifying the needs of faculty members; proactive solutions to professional development in teaching and learning should be generated.

1.4 Purpose of the Study

This study aims to identify EMU faculty members' self-reported beliefs and needs in professional development in teaching and learning. Their needs and beliefs about using the latest and diffused ICT-based opportunities for professional development will be investigated as well. The research questions addressed in the research will be as follows:

1. How are the faculty beliefs in professional development in teaching and learning?

2. How do the faculty beliefs in professional development vary depending on their:
   (a) gender, (b) academic status, (c) field of study, (d) academic unit, and (e) teaching experience?

3. How are the faculty professional development needs in teaching and learning?

4. How do the faculty's needs in teaching and learning vary depending on their: (a) gender, (b) academic status, (c) field of study, (d) academic unit, and (e) teaching experience?

5. How is the relationship between faculty beliefs and professional development needs?

6. How are the faculty beliefs in ICT-based professional development in teaching and learning?

7. How do the faculty beliefs in ICT-based professional development in teaching and learning vary depending on their: (a) gender, (b) academic status, (c) field of study, (d) academic unit, and (e) teaching experience?

8. How is the relationship between faculty beliefs in professional development and beliefs in ICT-based professional development?

1.5 Research Variables

The dependent and independent variables used to respond to the research questions are shown in Figure 1. Dependent variables are the two belief scores for professional development in teaching and learning and ICT-based professional development in teaching and learning, in addition the needs for professional development in teaching to learning. Independent demographic variables are gender, academic position, field of study, academic unit, and teaching experience.

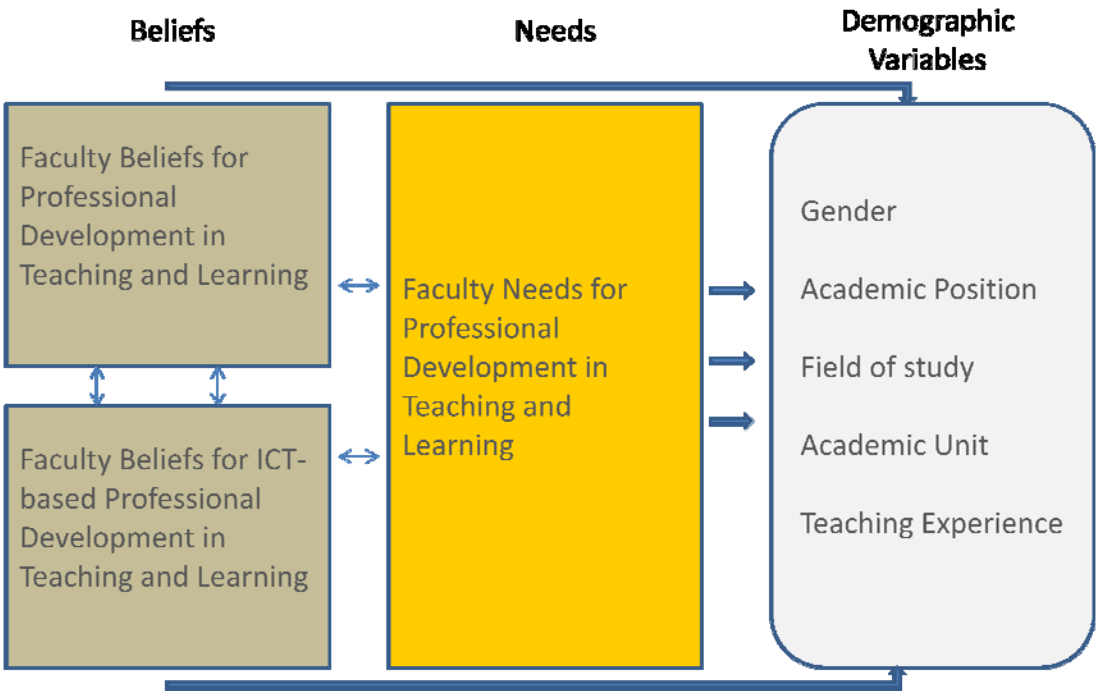

Figure 1. The dependent and independent variables

1.6 Significance of the Study

Faculty professional development is important for maintaining and extending quality in teaching and learning. This improvement will help faculty not only in their self-development but also in their awareness of global trends in teaching and learning. The busy schedule of faculty holding responsibilities such as teaching, research, and service cannot be neglected. In this context, ICT-based professional development offers flexibility and sustainability for faculty to learn anytime, anywhere, and any pace. As a result, ICT-based models can be chosen as an effective means for professional development in teaching and learning.

In planning and designing professional development programs, the goals, needs, interests, previous experience, beliefs, and skills of faculty as adults should be taken into careful consideration. This provides a comprehensive and holistic approach to

the process of professional development. Faculty professional development needs and beliefs about professional development and using ICT for professional development will be urgently needed to achieve the objectives.

Such concerns, if addressed properly, should help improve teaching and learning in EMU. The study will judge whether or not members of faculty from different disciplines in EMU believe in the opportunities offered by ICT-based models for their professional development in teaching. The existence of faculty resistance caused by their beliefs about using ICT-based models is worth being examined since barriers in content and framework must be removed for learning to occur. After all, faculty cannot be imposed upon to use a particular model for teaching and learning that they do not accept (Chen & Chen, 2002).

In addition, it serves well for further evaluation studies and developing a baseline for sustainability. By means of evaluation of the effectiveness of the program with respect to beliefs and needs of the faculty and the feedback provided, EMU will improve its faculty development strategies.

It is hoped that the deliverables of this research may be used as input to create a faculty-centered professional development framework in the future. This conceptual framework can be used to design an ICT-based professional development model for EMU based on faculty needs and beliefs. Using this model, planning, designing, and implementing prospective faculty development programs may also become possible. These will embrace the goals, needs, beliefs, interests, and expectations of the faculty, in relation with global developments. Fruitful professional development efforts by the university will likely help improve quality. These will also help to

diagnose existing problems and to take the appropriate precautions for faculty professional development.

It will also set an example of other universities for identifying needs and beliefs for faculty development to attain international quality in teaching and learning, besides achieving quality to fulfill the needs of international and local students. As a result of this research study, not only EMU, but other institutions in the higher education system in North Cyprus and all around the world will be provided with the necessary data to improve the education system, thus benefiting all the stakeholders.

1.7 Assumptions

The important assumptions in this study are as follows:

- Most faculty in higher education institutions are assumed to be in need of training about teaching and learning since usually they do not have professional training in the field of teaching before starting the teaching career.

- Faculty are assumed to have certain beliefs that create barriers against professional development in teaching and learning and using ICT-based models for professional development.

- ICT-based models are assumed to be effective in meeting faculty's professional development needs.

- It is assumed that if faculty members in higher education institutions are well informed about new approaches in teaching and learning and opportunities

offered by ICT-based models, then a sustainable professional development process could be started.

- It is also assumed that quality education requires faculty's continuous professional development.

1.8 Definition of Terms

The following are the initial definitions for important terms and concepts within the context of this study.

Faculty: Teaching faculty members, such as professors, associate professors, assistant professors, and instructors employed on a full-time basis in a higher education institution.

Faculty beliefs in professional development: Faculty acceptance of the benefits or drawbacks of development in the teaching profession. These beliefs are facts or opinions which are established as real without any direct personal knowledge. They can also be based on evaluations from prior professional development experiences.

Faculty beliefs in ICT-based professional development: Faculty acceptance of the assistance and hinderance created by the use of ICT for professional developmental purposes. These beliefs are claimed as true without personal experience. They can also be based on judgments from previous ICT-based professional development practices.

Educational needs of faculty: The needs of faculty to handle the changing student demographics, student learning styles, multiple intelligence, educational

technologies, instructional methods, student assessment, learner-centered educational philosophy, and teaching materials.

Professional development: Activities to enhance professional career growth which includes formal and informal means. It embraces learning new skills, using technology, developing new insights into pedagogy, putting into practice and exploring new or advanced knowledge of content and resources.

Continuing professional development: The learning process that should be maintained throughout the professional life of faculty. Since professional education should be sustained, it requires the ability to continue a defined behavior indefinitely which results in continuing professional development of faculty in higher education. The long-term planning of programs is required to satisfy the needs of faculty.

Professional development program: Set of activities that are planned and organized with the purpose of empowering faculty in teaching and learning.

Teaching and learning: One of the scholarly disciplines in the teaching profession with the aim of imparting knowledge or skill. Successful teaching is undertaking some tasks and activities that facilitate the learning process of students. Teaching is deciding ‘what to teach’, ‘how students learn’, and ‘how to teach’. After designing the instruction, it also needs proactive selection of the instructional models and strategies according to the subject matter and the learner. Learning is acquiring new or modifying existing knowledge, behaviors, skills, beliefs, values, or preferences as a result of teaching. Teaching is one of the responsibilities of faculty, in addition to research and service.

Quality education: Achieving high standards, excellence, and continuous development in teaching and learning. In this study 'quality education' is used to refer to high quality education.

Technology enhanced learning: The support of any learning components such as learning resources, context, objectives, communication, collaboration, teacher, and learner through technology.

ICT (Information and Communication Technology): Various technologies used for creating, distributing, storing, and managing information as well communication. This concept ranges from the everyday use of computers to the Internet-based technologies and broadcasting technologies such as radio and TV, and from supporting teaching to collaboration of a network of global learners.

Chapter 2

LITERATURE REVIEW

This chapter begins with an overview of previous research on professional development in teaching and learning, to be familiar to the related literature in general. Later relevant studies in relevant fields are given in detail. These are the studies related to faculty beliefs and needs about professional development and about ICT-based professional development. This chapter also introduces a framework for this study to compare and discuss the findings with other related research.

2.1 Professional Development in Teaching and Learning

To start with, the literature related to faculty professional development in general and ICT-based professional development in specific are explored. This was the evidence for having even more literature and studies related to ICT-based learning and development recently. As a result, ICT-based models exist as forms of continuous faculty professional development opportunities.

2.1.1 Professional Development

Although education is the main focus and one of the imperative dimensions of quality in higher education institutions, professional development in teaching and learning and technology come later (Cox, 2004; Elton, 1993). Since faculty embrace various roles, it may not be easy to define the scope of professional development of academics in higher education. Their three main roles are teaching, research, and service (Caffarella & Zinn, 1999), in addition to the traditionally accepted

administration and management roles and their more recent role as technology experts (Ferman, 2002; Blackmore & Blackwell, 2003). Furthermore, according to Elton (1993), academics as teachers usually dedicate themselves to their academic disciplines and participate in networks of support for research (Kane, Sandretto, & Heath, 2002). Elton and Patington (as cited in Elton, 1993) also claim that, in academic culture, quality and professionalism is more identified in research than in teaching. Faculty may engage in individual personal development in the area of research since they are primarily dedicated to discipline-based work.

In the 21st century, training faculty for the professionalization of university teaching is an important issue. The number of students is rapidly increasing and there are important changes in students' demographics – age and ethnicity. Students have different expectations and demands from the higher education institutions. State-of-art technologies are emerging, a fact which alters teaching and learning methodologies. All these changes are affecting the curriculum and instructional designs where innovations, social change, and the need to keep the knowledge base up-to-date are important concerns. Members of faculty need professional development to be aware of these changes and reflect them in their teaching. As a conclusion of the literature review on the need for professional development, Millis (1994) says that professional development programs are necessary to respond to multifaceted changes and should be updated frequently.

In the knowledge era, the professional development of faculty for these roles is multi-fold: teaching, research, and technology. Kugel (1993) suggests a framework to reflect upon the development of faculty as teachers. For promoting teaching and

learning, professional development in teaching should also be prioritized by faculty. Development in teaching includes improving teaching skills, curriculum, teaching and learning; and acquiring lifelong learning skills (Soran, Akkoyunlu, & Kavak, 2006). Most faculty in higher education do not have a background in teaching and learning and they teach either in the way they were taught (Layne et al., 2004) or in a way that fits their own learning preferences (Taylor & McQuiggan, 2008). Elton (1993) even says that lack of training creates a doubt of professionalism in this area. In spite of this, professional development is often used in literature as formal learning related to teaching quality (Nicholls, 2001). 'Quality teaching' implies excellence, meeting the standards to satisfy the needs of the students (Ellis, 1993), resulting in 'fitness for the purpose of promoting learning' (Elton, 1993).

As a result, teaching and learning, the most lacking component of professional development, needs to be more emphasized in quality efforts. Various combinations of teaching and learning with technological skills and competencies are needed. The improvement of faculty members' teaching skills with a focus on faculty is defined as 'faculty development' by POD.

There is quite a wide range of research and findings about faculty development in general, and teaching and learning in particular. These studies can be categorized into four main groups. Some of them spot the existence of professional development initiatives within higher education institutions. Others enlighten the path for developers for planning and designing professional development. These can determine the activities and beliefs, needs, goals, expectations, and values of faculty. The third category is for evaluating ongoing professional development programs and

the last category concerns determining the effectiveness of the programs including some follow-up surveys.

The investigation of the status and need for development studies has been done since a considerably early date. Centra (1976) conducted a study to collect information about all 2-year and 4-year colleges in the United States of America. In the first phase, 60% of 1783 higher institutions claimed they already had programs or some development activities and an additional 3 to 4% were in planning. In the next phase, 756 faculty development coordinators responded to Centra's questionnaire. The goal was to investigate types of professional development programs and faculty involved, the approximate use and effectiveness of the activities, and funding. Workshops or seminars about various instructional methods and techniques were found to be the best attended and the most efficient topic in terms of serving the needs of the majority of faculty. The profile of faculty who preferred to attend developmental activities was also explored in his research. Findings indicated that those who actively attended more than half of the activities offered were good teachers (70%), younger faculty (50%), and faculty with over 15 to 20 years of experience were involved very little compared to others.

In the 1990s, when professional development programs were still in their formative stage, Sydow (1993) prepared a similar report on the Virginia Community College System (VCCS) system to analyze professional development. The first study involved a professional development survey to determine current professional development activities and individual goals of 2,070 staff and institutional support. The results identified that over the previous three years faculty had participated in the

following highly ranked activities: conference attendance (87.7%) and planning (57.7%), course revision (63.3%) and new course development (51.8%). The majority of respondents (86%) stated they aimed to attend activities in the near future. Lack of time (43.2%) and money (27.7%) were identified as barriers to attend professional development activities. Professional conferences (92.4%) and workshops, presentations, etc. (86.8%) were found to be preferred activities by faculty for professional development. The second study involved a survey that investigated different approaches to professional development in 23 colleges in the VCCS. 43% of colleges reported having a professional development program even though most were at the design stage. Age and years of teaching experience were found to affect participation in professional development activities. New faculty with less than five years' experience was less involved, where contrary to Centra's (1976) findings, mid-carreer faculty with 11 to 20 years' experience were more actively involved in all kinds of professional development activities. Gender created differences in professional development activities, in that women choose more group-oriented and interactive professional development activities than men.

Later, Sydow (1998) distributed a questionnaire in the follow-up survey to the professional development activities and needs in 1997 similar to the original and received 2,137 responses. Compared with the findings of the previous study, community colleges showed a very slight increase in time dedicated to professional development opportunities over the previous five years. The most attended activities had changed to conference attendance (92%) and planning (64%), course revision (66%) and new course development (56%). A newly added activity, 'revised course to reflect new developments in technology' was also rated highly (62%). Peer group

conferences and research grants were also reviewed using qualitative methodology to investigate the outcomes of the professional development initiative implemented in 1993 by the VCCS. The aim was to find out whether participation in professional development activities satisfied faculty needs and helped them improve themselves in teaching and learning. Results show that faculty stated their needs were addressed and students' learning was enhanced.

Eddy (2007) did a research in community colleges to investigate professional development activities on offer. The findings, by order of importance, are technology use in traditional teaching and learning, teaching online, and assessment in rural areas; integrating technology into classrooms, teaching online, and student-centered learning in urban areas.

A discipline-specific situation analysis was performed by Brawner, Felder, Allen, and Brent (2001) for SUCCEED (Southeastern University and College Coalition for Engineering Education), a coalition of six schools, to find out teaching experiences and practices of engineering faculty members. 1999 survey results indicate more faculty (82%) attending at least one teaching and learning workshop on campus. Similarly, the researchers conclude that the number of seminars attended has a positive correlation with trying new teaching and learning approaches. Professors who report participation (77%) are fewer than assistant professors (87%) and associate professors (%86). Faculty members believed that they give more significance to teaching quality than their colleagues and administrators.

Ferman (2002) conducted a study investigating valuable events and activities in developing the professional knowledge of a group of lecturers from different

disciplines and teaching stages at an Australian university. The constructive approach used in the research methodology gave faculty an opportunity to use their prior experience in work-embedded events and activities. A qualitative case study was used to list and rank the activities that had contributed to faculty professional growth over the previous two years. The results show that the participants attended a wide range of professional development activities where the most frequent types were formal collaborative, formal individual, informal collaborative, and finally, informal individual activities. Within the collaborative activities six themes were rated high: working with an educational designer, attending workshops and short courses, attending conferences, discussions with peers, presenting at conferences, and being mentored. Interestingly, networking was a minor theme among the collaborative means, and using new technology was also a minor theme among the individual means. The results show that collaborative activities were valued by all faculty, regardless of teaching experience. From a different perspective, interaction type can facilitate reflections for collaborative learning and independent learning.

Some studies concentrate solely on Faculty Learning Communities (FLCs). Richlin and Essington (2004) conducted a survey in 2003 including 165 academic institutions having FLCs in the USA and Canada. Three follow-up surveys were sent to those institutions aiming to identify the types, sizes, participants, and activities of FLCs. The first one investigated the use of technology and forming FLCs. The second examined the impact of FLC participation and integrating diversity into teaching. The third survey was concerned with integrating teaching and learning scholarship in FLCs. Responses from 33 USA states and four Canadian provinces

amounted to a total number of 308 FLCs. Teaching and learning scholarships and technology topics were the highest activities within a total of 492 topic-based FLCs.

Some research puts more emphasis on the consequences of faculty's different career stages on professional development. A study by Romano et al. (2004) uses the results of faculty attending an innovative Mid-Career Teaching Program (MCTP) in 1998 and its effects on participants' professional and personal careers. Members of faculty who attended this program organized by the University of Minnesota were of different ages and had varying degrees of experience. In 2001-2002, a formal evaluation was conducted and qualitative and quantitative data was collected for this purpose. The evaluation revealed that faculty who were around age 40 to 60 and at the associate or full professor rank benefited from the discussions on teaching and learning during the program and learned new teaching methods, improved their teaching style and felt increased confidence in the classroom. The follow-up questionnaire after two years also showed that 57% of faculty claimed their motivation to attend was to 'develop teaching skills and improve teaching effectiveness'.

Sorcinelli et al. (2006) investigate the purposes, issues, and preferences of faculty developers in the Professional and Organizational Development Network in Higher Education (POD) from the USA and Canada and sheds light on the challenges faced by higher education institutions. The findings of the study on professional development of faculty are vital to improve institutional quality. They conclude: "faculty developers are still dedicated to their earliest goal of addressing the needs of the 'whole person' in a flourishing campus environment. They are dedicated to

creating an academic rainforest that is generative, renewing, based on discourse across boundaries, and offering mutual support, collegiality, and community in every sense of those words." (p. 176) On the other hand, Shay (2012) argues that educational development, used for professionalization of teaching and learning in higher education, might manage knowledge building competence of the higher education institutions.

Most of the literature supports the significance of junior faculty professional development since young people's beliefs are not as firmly established and there is a better chance of change. Villar Angulo and Alegre de la Rosa (2007) conducted a research study to find out whether online courses in an innovative faculty development program prepared for junior faculty help them to develop their attitudes and Curriculum and Teaching Capacities (CTC) learning. In the first questionnaire feedback and attitudes were assessed while the second examined their CTC learning. The results showed that junior faculty who participated in individual or group online development activities develop competence in curriculum and teaching and obtain a better understanding of how to teach in their disciplines.

The research literature also included studies for the evaluation of professional development programs. Camblin and Steger (2000) surveyed the impact of Faculty Development Program of a US university that has 18 colleges. They found out that faculty benefited from development activities mainly in developing pedagogical skills, changing certain teaching approaches, and implementing curriculum updates. Faculty may benefit more by using ICT-based approaches, since they can be designed according to the individual needs of faculty.

2.1.2 ICT-based Professional Development

ICT stands for Information and Communication Technologies, which represent "the coming together of computers - Information Technology (IT) with telecommunications technologies" (Fallows & Bhanot, 2005, p. 1). The use of ICT in the 21st century is not only essential for enhancing the quality of higher education but also needed in the continuous development of faculty (Fallows & Bhanot) called 'e-development' (Jordan & Jameson, 2005). The use of ICT in education is crucial.

ICT can be used at different levels for traditional and new professional development approaches to support continuing professional development. It can extend between using presentations to using interactive discussions and even simulation programs. ICT-based education includes teaching and learning activities using computer-based and online (web-based) tools and resources to support learning. ICT-based education helps sharing learning experiences from simply reading or printing educational materials to creating global connections (Fallows & Bhanot, 2005) and opens horizons for innovative ways to teach and learn (Duke, 2002). Faculty members need to follow up innovations in 'new ways to teach and learn'.

As Shephard (2004) emphasizes, innovation by faculty requires time to develop new skills and engagement in technology. ICT offers great flexibility such as accessing resources, accessing experts and peer support, satisfying learners' various needs, choice of pace and place, and choice of preferred learning style (Fallshaw & McNaught, 2005; Gibson, Alha, Kjaer, Kairamo, & Lorentsen, 2001). The opportunities offered by flexible timing and other choices that are facilitated by ICT are ideal for continuous faculty development. Another kind of flexibility offered is

catering to the needs of faculty who prefer to learn either individually or in a group, or to be coached and mentored by an experienced member of faculty. It is also possible to tailor staff development to an individual teacher or to a group of teachers (Gibson et al., 2001).

Harland and Staniforth (2003) suggest that ICT can be a good choice for 'lonely teachers' as they are called by Cox (2004) or 'lone wolf' as they are called by Sherer, Shea and Kristensen (2003). Such members of faculty can be involved in communities without violating their isolation. Professional development networks formed by faculty allow them to go global from their offices and to learn beyond the boundaries of their university and their country.

Lally and McConnell (2005) underline the emerging role of ICT in networked professional development. The Internet usage opens up virtual technology enhanced learning environments. This includes discussions, participating in various activities and collaboration among peers, experts and mentors, online guests, archiving, different models of interaction, peer-to-peer work, personal projects, e-mentoring, and online conferences. Webinars, blogging, micro blogging, podcasting, and wikis are some of the Web 2.0 technologies as an escalating trend in the formal and informal professional development of faculty. The use of Web 2.0 facilitates new methods to enhance communication aiming at teaching and learning (Solomon & Schrum, 2007).

On the other hand, Taylor and McQuiggan (2008) comment that many professional development programs for online teaching do not make significant changes in

teaching. They claim the reason is that programs concentrate on technical aspects for developing skills and do not address the pedagogical side.

2.1.3 ICT-based Models for Professional Development

Sparks and Loucks-Horsley (1989) cite definitions of 'model' termed in 1972 and 1987 by Joyce and Well, and Ingvarson, respectively. According to Joyce and Well, a 'staff development model' is a pattern or plan that can be used to guide the design of a program. For Ingvarson, a model can be a design for learning that embodies a set of assumptions, from which knowledge about teaching practice comes, and how teachers acquire or extend their knowledge. In brief, a professional development model in teaching and learning is a conceptual design guiding faculty in development.

Online Learning Communities Models

Technology is a driving force lead to online Faculty Learning Communities (FLC) models. The underlying idea is creating a professional online community that allows faculty to share the responsibility of their learning. FLCs are based on theories of adult education, experiential learning, and constructivism (Hubball & Poole, 2003). They also aim to provide resources, engage faculty in multidisciplinary teaching and learning, and organize activities for faculty in varying ranks, disciplines, and stages. These create more flexible, accessible, and stronger relationships compared to face-to-face models (Cox, 2004; Vaughan, 2004), changing institution-bounded FLC to a global community of resources and connections (Sherer et al., 2003). Field (2005) defines them as web-based communities where the participants use ICT as tools to communicate and collaborate in order to share knowledge base and experiences. It shifts from communication of information to collaboration on extending knowledge

(Dede, 2003). These communities form an environment to connect people who have the same professional interests as an efficient approach to develop and support faculty. In recent years, the number of formal or informal online communities in education has been gradually increasing (Field, 2005). The development of these online communities facilitates the learners' lifelong learning plans using various learning opportunities (Chen & Chen, 2002).

Networked Professional Development Models

The computer networks used for staff professional development increase networked communication, and communities start to gather on the Internet (Lally & McConnell, 2005). These smooth the progress of ways to create links among professionals and exchange experiences globally. Universities are now forming their own online learning environments and networks for social and collaborative professional development. They facilitate faculty working and collaborating across departments and institutions (Brent & Felder, 2003; Lally & McConnell, 2005). Online guests, archiving, online discussions, mixed-mode interaction, participant-paired work, personal projects, mentoring, and online conferences are some of the strategies used to support networked professional development (Lally & McConnell, 2005). Communities are formed around networks for e-mentoring (Field, 2005). Recently used strategies on networks are video case studies and Web 2.0 (blogs, wikis, podcasts, webcasts) (Solomon & Schrum, 2007).

Distributed Learning Community Models

The 'distributed learning community model' creates a distributed learning environment so that educational experiences can be shared over geographical settings, across time, and across various interactive media (Dede, 2003). Both Cox'

(2004) and Dede's (2003) models are based on the 'learning communities model' which favor diversity of expertise and a collective knowledge base. Dede's model is a mixture of face-to-face and virtual interaction patterns and uses both asynchronous (online discussions) and synchronous (virtual media, chat rooms, and interactive media) learning environments. Distributed learning communities help peers share knowledge, and as Dede (2003) states, the participants can be either new or experienced faculty. The model developed by Dede (2003) supports professional development via distance learning, video case studies creating virtual communities of practice (CoP).

Communities of Practice (CoP) Models

Communities of Practice (CoP) are groups of people who share a concern or a passion for a profession and learn how to do it better as they regularly interact (Wenger & Snyder, 2000). In CoP, the faculty must have knowledge and competence to share with the other members of the community. Lifelong competence development can be facilitated by CoP where situated learning takes place in a specific context. Considerable research confirms virtual learning CoP for professional development and strongly emphasize two important aspects: collaboration and professional socialization of faculty (Sherer et al., 2003). They also mention that FLCs are examples of CoP in that a community of instructors collaborates to discuss a specific domain of 'teaching and learning'. CoP sustainability is possible by creating user motivation and interest (Solomon & Schrum, 2007).

Online Workshops / Seminars / Conferences / Courses

Online workshops, seminars, conferences, and web-mediated or online courses are other means of online learning. Live online faculty development workshops (Blyth, May, & Rainbolt, 2006) and web-mediated faculty professional development certificate courses (Fulton, Noonan, & Dorris, 2004) are models for making faculty familiar with new technologies and their associated pedagogy. Taylor (1997) outlines a graduate certificate in Open and Distance Learning (ODL), a global faculty development program via the Internet. Another online training and mentoring model for academic staff development is the University Teaching Professional Development Model introduced by Villar Angulo and Alegre de la Rosa (2006). Another hybrid curriculum-based model leads to a postgraduate certificate in Education and Professional Development (MacKenzie & Staley, 2001). Levy et al. (2003) describe and analyze a networked group learning project (CBCGW) to build a short online course for teachers and higher education professionals enabling them to ICT for educational practice.

Social Networks for Professional Development

The collection of new, mostly open-source, web-based tools referred as Web 2.0 is used to build an 'online learning community'. These are community networks, blogs, wikis, and sites for sharing photos, links, and videos (Solomon & Schrum, 2007). Community networks, widely called social networks, are all tools to connect people. Christine Greenhow suggests in her blog the need to develop alternative professional development models including using social networking tools, in this way involve faculty in a hybrid professional development model (Solomon & Schrum, 2007, p. 107). They also stress that the presentations for the practical and pedagogical use of online social tools may develop into models for professional development in the

future where all events will take place online, peers helping peers, and the completed sessions will respond to requests for later reviewing. Social networks on the Internet also allow faculty to share knowledge and expertise in a socially constructed professional environment where they can provide links, add content, start discussions, write blogs, and support peers.

Multimedia Models

The VisionQuest© CD-ROM is a six step model which examines both the pedagogical beliefs and classroom practices of teachers and encourage them to reflect and collaborate (Ertmer, Johnson, & Lane, 2001). Thus, teachers gradually develop their own understanding about how to integrate technology into their professional activities. In this model, the growth of teachers' visions for teaching and learning with technology are facilitated.

Process-based Models

McLoughlin (2000) suggests a process-based model for professional development where faculty beliefs and needs play a central role. In her multi-dimensional approach to support online teaching, beliefs about teaching and learning should emerge and may be challenged and extended through discussions with peers and developers. Skills-based training, individual consultation, workshops, faculty-based collaborative projects, and discussions are elements of this multi-dimensional approach. She defines the professional development process as an integration of individual beliefs about teaching, contextualized faculty needs and strategic level decisions. Reflection on this process will result in helping faculty to re-evaluate their goals (personal, departmental, and institutional) which will result in changing their beliefs.

Project-based Models

Interactive web pages using an online course management system (CMS) are designed to support the collaboration of faculty that would enhance the success of each project (Nuffer, 2008). These projects have faculty development as a component and faculty are engaged in 'hybrid collaboration' using the web pages to share, chat, review, and revise, in addition to regular face-to-face meetings. They also represent the new faculty roles in the new higher education institutions.

Portal as a Model

The Faculty Development (FacDev) portal was created for faculty professional development and support activities (Abdous, 2005). The calendar, event, community, online tutorials options used in the portal provided faculty with a personal and collaborative environment in which to learn, share, and reflect on their practices.

2.2 Faculty Beliefs about Professional Development

Beliefs are strong personal truths that structure behavior (Bandura, 1986). Pajares (1992) clarifies the confusion between belief and knowledge: Belief is based on evaluation and judgments from previous experiences whereas knowledge is based on objective facts. The importance of beliefs about teaching and their relationship with practice have been the object of research. Pajares (1992) investigated primary and secondary teachers' beliefs and Kane et al. (2002) studied college teaching.

The terminology usually refers to teachers' beliefs about students, teaching and learning, and schooling. Pajares (1992) calls these 'teacher's educational beliefs'. These beliefs may be categorized according to teaching and learning approaches as teacher-centered beliefs, learner-centered beliefs, and learning-centered beliefs (Cho

& Brown, 2007), in other words, transmissionist beliefs or constructivist beliefs (Teo, Chai, Hung, & Lee, 2008).

A review of the literature reveals that beliefs have an important role in faculty approaches to teaching and learning, technology and professional development. As previously mentioned, faculty often teach the way they were taught. Beliefs about teaching are established by the time teachers (as students) start university (Pajares, 1992). Faculty beliefs about 'good teaching' come from the ways faculty have learned in their trainee years as assistants in classes, tutorials, or laboratory sessions (Kane et al., 2002). They are referred to as ''preferred ways of teaching'' by teachers (Teo et al., 2008).

Pajares (1992) writes about individuals' conceptualization of 'belief systems' that help them identify and understand the world and themselves. Sorcinelli et al. (2006) deducted from related literature that faculty belief systems consider development as being more academically professional in their discipline however not necessarily being professionals in teaching.

Professional development in teaching and learning has a barrier which is the beliefs of teachers. The assumptions and practices teachers hold influence their perceptions and judgments, which, in turn, influences their practices (Pajares, 1992). Finally, these beliefs about teaching in general and good teaching in particular shape the teaching approaches faculty apply in the classroom. Layne et al. (2004) note that faculty come to professional development with prior knowledge, which affects their learning. This is an important aspect to be understood by faculty developers to guide them in their work (Pajares, 1992).

Guskey (1986) claims that in order to develop and change, the beliefs have to change within a process. He also recommends a model development program that will bring change in teacher's attitudes. However, core beliefs and beliefs which were adopted a long time ago are stronger and more difficult to change, especially among faculty, as they are adults (Pajares, 1992; Kane et al., 2002). Although it is not impossible, it is not very easy either and teachers themselves need to understand their own beliefs (Layne et al. 2004). Faculty development should focus on the need for continuous support and guidance for professional development in teaching and learning practice to change teachers' beliefs (Guskey, 1986; Kane et al., 2002; McLoughlin, 2000) or 'unlearn' (Dede, 2003). They suggest inquiring about how teachers' beliefs and conceptions of teaching and teaching practice change over time, in other words, 'how university academics learn to teach'. If faculty members' beliefs are contrary to those of faculty developers, they will not want to change and practice what they have learned (Collinson, 1996; Johnson, Thompson, Wallace, Hughes, & Manswell Butty, 1998; Pajares, 1992). On the other hand, a process-based professional development model by McLoughlin (2000) suggests that faculty beliefs about teaching and learning should first come to the surface. He claims that change is more likely as a result of a reflection process on beliefs through discussions with peers and developers.

How is it possible to change teachers' beliefs? How is it possible to build knowledge on the beliefs that teachers hold before attending development programs? Here comes the importance of individual development to be aware of the differences in beliefs and attitudes. Faculty beliefs related to professional development, teaching

and learning, and ICT use will provide the keys for the design of change for educational institutions in the new era.

There are some professional development models that emphasize the importance of faculty beliefs. Although teacher beliefs are examined extensively in many studies, there are fewer studies about faculty beliefs in higher education. Beliefs and needs are explored together by Kalivoda, Sorrell, and Simpson's (1993) whose research inspected the goals, beliefs, and carreer-stage needs of faculty for successful professional development activities. The survey includes 42 Lilly teaching fellows and mentors of a university in southeast USA. The results of the study show that the activities should be targeted depending on career stages. Junior and new faculty were the only ones who stated their need to develop themselves in teaching skills and teaching style enhancing activities.

Researchers sometimes look for professional development beliefs on a very precise topic. Johnson et al. (1998) surveyed 19 middle school mathematics teachers and 18 school of education faculty members. The aim was to investigate whether professional development in performance-based assessment is required and the variation between the teachers' and the faculty members' beliefs. The results were intended to guide in organizing faculty development workshops. Both teachers and educational faculty participants stated they attach importance to professional development. Comparing the findings, teachers do so more than faculty. Members of faculty and teachers were diverse in their beliefs in the importance of and need for professional development.

Cafferalla and Zinn (1999) did a case study to determine the domains which influence professional development and the enabling and disabling factors. The four domains were people and interpersonal relationships, institutional structures, personal considerations and commitment, and intellectual and personal characteristics. In their paper, the case of a professor was used to show the effect of development factors in four domains. They came to the conclusion that "Strong personal beliefs and values about the value of continuous professional development; sense of obligation to be active teachers, scholars, and learners throughout the career" (p. 248) are among the intellectual and personal enabling factors of professional development.

Faculty beliefs in technical institutions were also investigated. Wallin and Smith (2005) did a research surveying full-time faculty in technical colleges to find out the activities that they believe important. The results are evidence that faculty believe in the importance of professional development activities. There were eleven competence development topics rated as important. These were to prepare instructional materials, teaching and learning strategies, individual and group instruction, curriculum development and update, academic advising, and instructional methods that develop higher-order (critical) thinking skills. The instructional cluster included the most activities that were rate as most important.

Diaz, Santaolalla, and Gonzalez (2010) conducted a study related to faculty attitudes towards the European Higher Education Area (EHEA), which also revealed faculty beliefs in professional development. From a European perspective, faculty needs in the field of teaching skills to overcome EHEA challenges were investigated in ten

different schools in Madrid, Spain. The researchers investigated faculty beliefs in order to design a training model that suits faculty needs. They conclude that faculty will improve teaching skills, develop competencies, develop individually, and be affected by changes through professional development. The results also show that faculty reported the need for teaching inquiry learning, critical thinking, and integrating new learning models.

Beliefs investigation in other research aimed to evaluate the effectiveness of a professional development activity. Norton, Aiyegbayo, Harrington, Elander, & Reddy (2010) interview new lecturers in a Postgraduate Certificate in Learning and Teaching in Higher Education program in the United Kingdom. They investigate the faculty's beliefs about the organization of the program and their teaching and learning philosophy, and whether completing the program has changed or held back their beliefs. The results show that members of faculty see teaching as facilitating learning more than transmitting knowledge although they added that the outcome of the courses may not be sufficient for them to practice what they have learned.

2.3 Faculty Beliefs about ICT-based Professional Development

Faculty attitudes and beliefs about teaching and learning also shape their choice of educational strategies used in the classroom. The emergence of the 21st century strengthens the role of ICT within the classroom. This brings up the significance of faculty beliefs about ICT-based learning.

Teachers' attitudes and beliefs about teaching and learning affect the adoption and use of technology in the classroom (Foley & Ojeda, 2007; Topper, 2000). Teachers use different approaches: they may integrate ICT for facilitating teaching and

learning of students either in a traditional way only for transmitting knowledge or constructivist way. Teo et al. (2008) conclude that if beliefs are more traditional and stress only transmitting knowledge, it will be difficult to use computers in a constructive way. They also add that ICT is not frequently used for high level learning outcomes and constructivist learning. Thus, faculty needs to change their way of using ICT.

Nicholls (2001) advocates that after faculty recognize the need for change, professional development can take place either in a formal or informal way of learning. As in teaching, most faculty may not have formal training to use and to teach with ICT. In addition, their beliefs can be a barrier against using ICT appropriately and effectively. Faculty beliefs about teaching and learning with ICT have to change to broaden the usage in the classroom. New faculty who have learned online themselves can be more successful when teaching with new technologies (Taylor & McQuiggan, 2008). This will guide us to change faculty beliefs by involving them in 'learning with ICT' before teaching with ICT. They will themselves learn and implement within a constructive approach, so that they can teach in the same way. A shift from traditional training to designing effective technology-enhanced learning environments can be possible with this approach (Hara, 2001).

ICT will provide flexible (anywhere, anytime, anyplace) and effective ways to develop professionally. To create these environments, the relationship between teachers' beliefs, knowledge, and practices, and their use of technology for teaching and professional development should be well understood. Faculty developers are

mainly concerned to organize support programs to learn about and integrate technology into their teaching (Sorcinelli et al., 2006). “Such professional development needs to take account of teachers’ perceptions about teaching and learning generally as well as their attitude and use of ICT” (Higgins & Moseley, 2001, p. 205).

ICT-based faculty development strategies not only develop technical skills of faculty but also create awareness of and practice in educational technologies (Lally & McConnell, 2005). In order to facilitate ICT use, Kiraz and Özdemir (2006) suggest that teachers with different educational beliefs should be aware of educational technologies with the help of faculty developers. Forcing them to use these technologies without first changing their beliefs will not be beneficial.

When faculty change their beliefs and attitudes about teaching and learning and the use of technology, then there is a potential for learning although it is difficult to use the same learning environments for all faculty. A Flexible Technology-Enhanced Learning Environment (TELE) has to be developed (Wang & Hannafin, 2005) and enhanced using different ICT methods, tools, and techniques which target to satisfy the diverse needs of faculty members.

The widespread use of computers and the Internet by faculty in the teaching and learning environment increased the number of studies on the use of ICT in education. Within ICT-based professional development, the most popular recent research is concerned with integrating technology in teaching, online teaching and learning (MacKenzie & Staley, 2001; McLoughlin, 2000; Taylor & Singh, 1997), and a more structured and individualized CPD framework for e-learning (LSC, 2007). On the

other hand, there are few studies on faculty members' ICT-based teaching and learning and ICT-based professional development.

Veen (1993) conducted research on in-service training teachers' beliefs and ICT usage. In this case study, the teachers kept a diary as a semi-structured record of their ICT usage at school and at home. Additionally, frequent interviews were done and computer-assisted lessons in the classroom and laboratory were observed. The results of the case study show that teachers have strong beliefs in the content of their subject matter and pedagogy and can use new media if it does not conflict with their existing beliefs and practices. The study concludes by emphasizing the persistence of beliefs: "Educational change is a slow process and teachers need time to gain experience with computers" (p. 148). In addition, this study comments that initial teacher training programs are not adequate to make teachers use ICT for instructional purposes, and suggests spending more time to change beliefs of student teachers.

Lumpe and Chambers (2001) developed the Beliefs About Teaching with Technology (BATT) instrument to assess teachers' context beliefs in using technology. The result was that the context and self-efficacy beliefs of the teachers were significant predictors of the teachers' use of technology-related learning practices. The researchers also came to a very impressive conclusion, stressing the importance of the assessment of context and self-efficacy beliefs since they can be tools for needs assessment and program evaluation.

Foley and Ojeda (2007) made a pilot study where, in the first phase, they examine the relationship between teachers' beliefs and their use of technology for instructional purposes using quantitative methods. The survey was administered to

10 participants from the College of Education in Northern Arizona University (NAU). The results of this phase show that faculty who believe students learn better through a structured curriculum use less web content for explaining course material inside and outside the classroom.

Teo et al. (2008) did an online survey to investigate the relationship between beliefs and the use of technology among pre-service teachers and whether the use of technology is predicted by gender, age, and beliefs about teaching. This study involved 582 graduates of a one-year program and some undergraduates in a two-year program in education. They claimed that the relation between faculty beliefs and the use of technology is conflicting and incomplete. The findings show that beliefs about constructive teaching correlate not only with constructivist uses of technology but also with traditional ones. On the other hand, beliefs about traditional teaching have a negative correlation with only constructivist uses of technology. In this research, Singaporean teachers are more inclined towards the transmission of knowledge. The results also indicate a significant relationship between beliefs about teaching and the use of technology. The authors claim that this may be because traditional use is perceived as being more functional than the other.

Within the EU e-competence initiative, alternative informal competence development approaches for faculty members concerning technology-enhanced educational innovations are analyzed by Hasanbegovic (2005). She states that these alternative approaches are expected to help faculty change their beliefs and attitudes since formal strategies may not meet these demands. Faculty may learn both using formal and informal approaches. Investigation of Personal Learning Systems for

continuous professional development was done by Chesney and Benson (2012). They investigated whether participants felt that using the PLS contributed to their continuous professional development. The results collected from participant blogs and later interviews showed that faculty believed that PLS helped them to reflect on their professions, although more active participation of collegues were expected.

2.4 Faculty Needs for Professional Development

After exploring the importance and composition of beliefs in professional development, faculty needs in various higher education settings are covered. In general, professional development activities are typically organized and held without considering the needs of faculty and done only for the sake of development. Faculty development programs are designed with assumptions of 'what faculty needs to know' (Taylor & McQuiggan, 2008). Solomon and Schrum (2007, Chapter 5) mention that professional development activities are often done 'just in case' rather than planning for 'just in time'. He explains the latter "training, which provides educators with information that they need just as they need it." (p. 103) as more vital. Instead of directing needs, the aim should be supporting faculty to identify their needs in forming continuing professional development activities (Ferman, 2002). In their 'Adult Learning Model of Faculty Development', Lawler and King (2000) take the first stage pre-planning in the sense of needs determination, whereas the other models take it for granted.

Adult learning theories specify the determination of needs as one of the main prerequisites for adult education. Malcolm Knowles' adult learning theory (1984) suggests that needs and interests should be assessed and the learning objectives be

developed accordingly. When adequate importance is given to target these objectives, development programs will be more responsive to the needs of faculty.

Although institutions mainly consider their organizational needs as essential, one of the primary goals of professional development is responding to individual faculty members' needs (Sorcinelli et al., 2006), a bottom-up approach where teacher needs are assessed (Kisner et al, 1998). These needs for development can differ depending on the diverse faculty population with different goals. Hubball and Poole (2003) did comprehensive needs assessment of learning context as a result of consultation with faculty about their needs, interests, goals, prior learning experiences, and learning styles before designing a program.

From a different perspective, Kisner et al. (1998) state that professional development moves from an individual process focusing on the developmental needs of faculty to a more organizational effort. They advise system thinking to improve professional development. With system thinking, the needs of all other stakeholders in a higher education institution, in addition to faculty and organization, have to be considered leading to the development of professional development strategies. However, Eleser and Chauvin (1998) advocate making a faculty need analysis that intends to support individual and organizational development initiatives.

The first step in achieving the analysis of needs is to determine the needs of faculty for professional development in teaching and learning. The needs are investigated through a variety of perspectives. The first that comes to mind is the faculty's willingness to participate in professional development activities. Faculty explicitly expresses their needs for professional development in teaching and learning

strategies (Kisner et al., 1998; Selman & Wilmoth, 1986). On the other side, faculty needs are explored in numerous research studies by questioning various dimensions of professional development. Some of the main investigations were content needs analysis (Taylor & McQuiggan, 2008); elements of program design (Selman & Wilmoth, 1986; Taylor & McQuiggan, 2008); areas of expertise, basic skills, and background knowledge of the faculty (Brew & Baud, 1996; Wilde, 1996); and the barriers for not participating in professional development programs (Taylor & McQuiggan, 2008). In addition to faculty's previous professional development, experiences are investigated and evaluations are made (Romano, Hoesing, O'Donovan, & Weinsheimer, 2004).

Assessing solely faculty needs in general may not be sufficient for faculty development efforts, considering that needs tend to vary from person to person. Since faculty are autonomous and independent in their jobs (Lawler & King, 2000), they prefer to develop themselves based on their personal needs. Therefore, formal professional development programs need to be flexible and respond to the diverse needs of faculty members (Sydow, 1993) and their current level of expertise (Wilde, 1996). ICT-based faculty professional development can be used as an opportunity to fulfill the continuous developmental needs of institutions in general, and of individuals in particular. As a result, needs are gathered from the perspective of either institutions or individual faculty members. Perceived competencies and professional development needs are used in designing professional development models.

The needs assessment results in universities and 2-year and 4-year community (technical, vocational) colleges are explored in many research studies. Among these, faculty needs for professional development are examined in two separate categories. One is the perceived need for content competencies and the other the preference for a particular way (format, time frame, duration, and environment) of developing knowledge, skill, and insight. This study concentrates more on the former.

Several needs assessment studies were conducted in technical, also called vocational or community colleges, which provide vocational and technical skills training. Some investigated whether faculty is in need of professional development or not. Selman and Wilmoth (1986) examine the needs of 180 part-time faculty in 25 Alabama technical colleges and find that 93% of them need to develop teaching skills and 89% participate in teaching education activities. The findings confirm that the design of programs has to take into account that faculty prefer short, intense, highly concentrated, local, and more practical professional development activities. The research also demonstrates that personal and professional development needs change depending on the status of faculty (graduate students, part-time faculty, adjunct faculty), stages of their career (new faculty, mid-career, retired faculty), whether they are vocational faculty or academic faculty, different disciplines, and the strategies of the universities (research or teaching-based).

The second research was conducted by Kisner et al. (1998) in vocational colleges in the USA. They investigate and compare the needs of vocational and academic faculty, using a bottom-up approach where faculty needs are assessed. This needs assessment shows that development initiatives are varied among faculty. While

teaching strategies is the first choice of vocational faculty, it is only the third choice of academic faculty.

A doctoral study by Standford (2002) investigates part-time and technical faculty at community colleges in 50 states in the USA. He examines the occurrences of professional development programs organized for the specific faculty and effective delivery methods. Teaching skills are grouped in six categories: course planning, instructional skills, classroom/student management, implementation of media, evaluation, and interaction skills. The perceptions of educational officers are such that the greatest need of part-time faculty is identifying the learning characteristics of the students which are the target for the development of instruction ($M = 4.26$). They claim they need pedagogical skills such as using different teaching methods to accommodate different learning styles ($M = 4.13$). Teaching skills in the media category indicates that participation in web-based instruction ($M = 4.52$) and participation in distance learning ($M = 4.20$) are moderately needed.

Another research in technical colleges by Wallin and Smith (2005) surveys full-time faculty competence levels for professional development activities. The study takes place in a technical college in the USA. Faculty expresses the importance of professional development and a feeling of not being self-sufficient. Using technology for student work, utilizing instructional methods for students to develop higher order skills are some of the activities where faculty expresses the need for professional development.

Data on the topic of competence development in the USA was obtained by Saena (2003) from a survey in a university. Faculty stated that improving student's critical

thinking skills (74%), learning about using technology to enhance student learning (73%), and how to increase student motivation (64%) were topics they needed the most. An interesting similar research by Krause (2012) examined and faculty members' perceptions of students' learning in disciplinary context where critical thinking and analytical skills were emphasized.

Moeini's (2003) awareness about faculty development and needs assessment survey, conducted in the Middle East Technical University (METU), Turkey, gives an idea about the difference in the needs of faculty members and research assistants. The purpose of the study was to find out the expertise in and importance of instructional, personal and professional development activities, as well as to identify the needs for a professional development program in METU. 72.5% of the research assistants and 57.6% of faculty wanted to attend to professional development activities although both faculty and research assistants see themselves as experts in 'measurement and evaluation'. Research assistants also rated 'establishing communication with students' the highest. Both groups rated 'knowing learning theories' and 'using multiple teaching methods' the lowest.

Likewise, previously mentioned Johnson et al. (1998) examine importance and needs related to professional development, specifically in performance-based assessment. The results show that faculty both emphasizes the importance (94.4%) and the need (94.4%) for continuous professional development activities such as workshops, seminars, and conferences. They also rated evaluating students' individual skill levels in group work in professional development as important (88.9%) and reported

the need for professional development in developing skills to convey the goals of performance-based assessment to students and families (88.9%).

A study on needs in online professional development conducted by Taylor and McQuiggan (2008) involves 68 faculty in Penn State World Campus responding to an online survey including open-ended questions. The survey includes two parts on online teaching experiences and online professional development experiences. The topics needed, the format and duration of online teaching faculty development experiences, and the barriers for not participating are also investigated. Findings aim to help design professional development programs for new and experienced faculty in distance education. In order to design and develop online courses, faculty reported the need for choosing appropriate technologies to enhance their online course (55.9%). Among course delivery topics, the greatest need was facilitating online discussion forums (47.1%). The most preferred formats of delivery were self-paced materials (42.6%) and informal face-to-face events (41.2%). The most effective learning mode was found to be one-on-one development with a mentor or colleague (55.9%). The majority of the participants indicated lack of time (61.8%) as a barrier.

A number of studies (Eleser & Chauvin, 1998; Ferman, 2002; Sydow, 1993) claim that faculty have different professional development needs, requests, goals, and interests at different ages and career stages. The study by Sydow (1993) was previously reviewed. In another study conducted to discover faculty preferences on professional development, Eleser and Chauvin (1998) discovered that top priority activities were sessions on ‘effective methods for stimulating student motivation’(37.42%) and ‘characteristics of effective teaching’ (32.65%). On the

other hand, activities that aim at developing course objectives (9.52%) were the lowest preferences for development.

This is also proved in another research. Villar Angulo and Alegre de la Rosa (2007) found out in their previously mentioned study that 79% of the junior faculty perceived the need for development in curriculum and teaching. The greater part of junior faculty between the ages of 25 to 29 identified their specific needs as learning new teaching skills, learning styles, and classroom learning evaluation.

Another study from Turkey carried out by Odabaşı (2003) with 427 faculty working at Anadolu University, investigated needs and found out that 54.1% of faculty participants perceive the need for all faculty to participate in professional development. Effective teaching skills (84.4%) and technology use (61.7%) were the most important areas where faculty needed development. Another finding was that faculty preferred workshops for professional development. Kabakçı and Odabaşı (2008) did similar research in 54 Education Faculties in Turkey. They discovered that research assistants need faculty development where 40.7% stated instructional development as their first choice and listed factors that affect their participation in the programs.

Hubball and Poole (2003) did comprehensive needs assessment in the learning context. Their study looked at the relationship between Learning Centered Education (LCE) and UBC Faculty Certificate Programme on Teaching and Learning in Higher Education. The 24 multidisciplinary participants were faculty attending the certificate program in a learning community format. An action research design was used where the data collected was both quantitative and qualitative. The results

suggest that LCE can be used for this kind of certificate programs where faculty will have the opportunity to be active and engaged. Another interesting inquiry was to ask participants to identify and rank ways they preferred for learning to teach.

Other interesting survey results by Diaz et al. (2010) were previously mentioned. They found out that faculty needs training for generic skills and integrating new learning models was ranked high in order to gain skills toward meeting European Higher Education Area challenges. Professional development programs should value faculty beliefs about development and be designed according the needs of faculty, so that faculty will benefit from these activities.

The literature displays a range of studies from technical colleges to universities, from the continent of America to Australia with faculty at different stages and status. These review faculty beliefs about professional development in general and ICT professional development in particular. The needs of faculty are also assessed, either to aid planning of professional development or to evaluate ongoing activities. Usually the beliefs and needs for professional development are investigated discretely. In our study, we are aiming to look at faculty professional development in a larger context where faculty will be considered and evaluated through not only their needs but also their beliefs in professional development in teaching and learning and beliefs in ICT-based professional development. We hope that this point of view will contribute to the literature to demonstrate the relationship between beliefs and needs.

Chapter 3

METHOD

3.1 Introduction

The main purpose of this study was to identify faculty members' self-reported beliefs and needs for their professional development in teaching and learning. The needs assessment will identify faculty members' perceived competence development topics in teaching and learning. Beliefs inventories for professional development in teaching and learning and ICT-based opportunities for professional development will also be developed and used to investigate the beliefs of faculty. This chapter describes the population and sampling, type of research, instrumentation, data collection, and data analysis methods.

3.2 Research Design

In order to achieve the aims of the research, quantitative research methods were used. As Mertens (1998) emphasizes quantitative research method is a method which is utilized to collect data from a larger number of participants, relying on individuals' self-reports of their knowledge, attitudes, and behavior. This procedure is limited to a set of questions that will facilitate comparison and statistical analysis (Patton, 2001). The study used descriptive research methodology to gather self-reports of EMU faculty members' beliefs and need in professional development in teaching and learning. Data collection survey research method was used through an instrument developed and implemented for this purpose. According to Mertens, surveys may not

gather fully valid information, since they rely on the honest responses of the participants. In the case of this study, the main reason for using the survey was the great number of subjects and their difficulty in finding time to meet the researcher. Besides, the researcher working as a full-time instructor had limited time.

3.3 Population and Sampling

Five universities in North Cyprus, namely Middle East Technical University Northern Cyprus Campus (METU NCC) in Kalkanlı (Morphou), International University of Cyprus (IUC) in Lefkoşa (Nicosia), European University of Lefke (EUL) in Lefke (Lefka), Girne American University (GAU) in Girne (Kyrenia) including Eastern Mediterranean University (EMU) in Mağusa (Famagusta) formed the context of the study.

The target population for reliability analysis on the two belief inventories was claimed to be 800 teaching faculty from five universities of North Cyprus. Population for the study as a whole, however, was chosen as all faculty members of EMU (n = 476). Faculty members involved in this study were full-time professors, associate professors, assistant professors, senior instructors, instructors, and lecturers that have a teaching responsibility. As a result of using one of the most common of all sampling techniques, convenience sampling, a subset of the target population had participated. It was used since the researcher was a full-time faculty member in EMU having limited time and work force. Also the population had the same limitations in responding the survey. Convenience sampling procedures were use to reach and distribute two belief inventories to 415 to faculty members in five universities. However, 209 valid responses from EMU and only 134 valid responses from other universities were collected. Total response rate was 83.7% (Table 1).

Table 1: North Cyprus Universities' participation for reliability

University	N	%
EMU	209	60.8
GAU	50	14.6
EUL	50	14.6
METU NCC	17	5.0
IUC	17	5.0
Total	343	100.0

All instruments; two belief inventories, a needs assessment tool, and a demographic information questionnaire, were implemented on the sample (N = 209) in Eastern Mediterranean University (EMU). The sampling frame of the study was the target population of all full-time teaching faculty members from various disciplines representing 11 faculties and schools and 40 departments. The participants are from the Faculty of Architecture, the Faculty of Arts and Science, the Faculty of Business and Economics, the Faculty of Communication, the Faculty of Education, the Faculty of Engineering, and the Faculty of Law. There are other participants from vocational disciplines in the School of Computing and Technology and the School of Tourism and Hospitality Management. The English Preparatory School and part-time faculty members are excluded from this study since their developmental needs may vary from others.

The instrument was distributed and collected during the spring semester of the academic year 2009-2010. The distribution of participants based on academic position is shown in Table 2. Out of 476 full-time faculty members in EMU only 275

were reached and 209 of those completed the instrument and returned to the researcher and this resulted in a return rate of 76%. This sample constituted 43.9% of the population.

Table 2: Distribution of participants and their academic position in EMU

Title	Total	%	Total Population
Professor	27	12.9	52
Associate Professor	36	17.2	75
Assistant Professor	62	29.7	150
Instructor and Lecturer	82	39.2	199
Total	207*	99.0	476

*: As the academic positions of two participants were not known, the total number is 207

It can be noted that $N = 82$ (39.6%) of faculty members were senior instructors and lecturers which constituted the majority of the participants. The second highest population of participants was assistant professors $N = 62$ (30.0%). Next came associate professors, $N = 36$ (17.4%); and the least number of participants were professors, $N = 27$ (13.0%). These numbers are in harmony with the EMU academic population, since for the total 476 full-time faculty members the distribution is: 52 (10.9%) professors, 75 (15.8%) associate professors, 150 (31.5%) assistant professors, and 199 (41.8%) instructor and lecturers.

3.4 Instrumentation

The instrument 'Faculty Professional Development Survey' used in this study was developed by the researcher. It was aimed to collect data about perceived beliefs and needs. Within this research, two main beliefs are investigated using belief

inventories. One was about professional development in teaching and learning in general, and the other was beliefs in ICT-based professional development in particular. The instruments are prepared with the underlying Adult Learning and Experiential Learning theories and literature review of similar research. According to these theories adult learning characteristics such as prior experience, values, beliefs, opinions, active engagement, self-directed, problem centered, perceived needs, individual differences, different learning styles and collaboration are used.

Hence, the instrument was designed to include four distinct sections: demographic information, needs assessment, and two beliefs inventories. The survey instruments are prepared as pencil-and-paper surveys. The reason for this preference was the results of a study conducted by Shannon, Johnson, Searcy, and Lott (2002). In their survey, 62 experienced survey researchers from the American Educational Research Association found that electronic surveys have a lower response rate than pencil-and-paper surveys. In addition, they present limitations in confidentiality, privacy, and credibility issues.

The survey instruments are the Faculty Needs Assessment Questionnaire for Professional Development in Teaching and Learning (FNATAL), the Faculty Beliefs Inventory for Professional Development in Teaching and Learning (FBITAL), and the Faculty Beliefs Inventory for ICT (Information and Communication Technologies)-based Professional Development in Teaching and Learning (FBIICT).

3.4.1 Faculty Beliefs Inventory for Professional Development in Teaching and Learning (FBITAL)

The aim of the Faculty Beliefs Inventory for Professional Development in Teaching and Learning (FBITAL) Questionnaire was to identify faculty members' beliefs in

professional development in teaching and learning. Both beliefs parts are prepared by doing an intensive literature review of research related to teacher and faculty beliefs and to previously developed belief inventories. They are then evaluated according to faculty formation in this area. Besides the beliefs that were gathered from related research some beliefs reported by EMU faculty in pre-survey explorations were also used. This part investigates whether or not members of faculty believe in professional development. They self-report on the kind of activities (face-to-face, blended, online, or computer-based), which capacity (individual or group work), or what type (formal, informal) they believe was more suited for themselves. A 5-point Likert scale instrument prepared by the researcher is used (5-Strongly Agree, 4-Agree, 3-Neither disagree nor agree, 2-Disagree, 1-Strongly Disagree).

3.4.2 Faculty Beliefs Inventory for ICT-based Professional Development in Teaching and Learning (FBIICT)

The aim of the Faculty Beliefs Inventory for ICT (Information and Communication Technologies)-based Professional Development in Teaching and Learning (FBIICT) Questionnaire was to identify faculty members' beliefs in using ICT for professional development in teaching and learning. It was inquired whether faculty believe in ICT-based professional development. Faculty perceptions about ICT and ICT-based professional development activities and types of ICT-based activities they prefer to use for their own professional development are investigated in this part. A 5-point Likert scale instrument prepared by the researcher was used (5-Strongly Agree, 4-Agree, 3-Neither disagree nor agree, 2-Disagree, 1-Strongly Disagree).

3.4.3 Faculty Needs Assessment Questionnaire for Professional Development in Teaching and Learning (FNATAL)

The aim of the Faculty Needs Assessment for Professional Development in Teaching and Learning (FNATAL) was to identify faculty members' needs for professional development in teaching and learning. Faculty needs in competence development topics were investigated by the researcher through an intensive literature review and exploring needs assessment surveys. These topics were gathered, categorized, and stored in a database. Later, the topics that were relevant to the teaching and learning content and context in EMU were selected to form a limited number of topics. They were then filtered through EMU's institutional needs and expectations and grouped under six categories: curriculum, teaching and learning methods, instructional technology, teaching environment, assessment, and student support and guidance. The topic items were prepared to emphasize key issues in the present educational era such as changing student demographics, teaching and learning approaches, student learning styles, multiple intelligence, educational technologies, instructional methods, student assessment, learner-centered educational philosophy, and teaching materials.

There was a concern about acquaintance with pedagogical terms used in FNATAL for faculty without a background in Educational Sciences. For this reason, the specific terms related to teaching and learning topics have a glossary of brief definition on the side of the form. These explained the pedagogical terms in simple sentences.

There were a total of 50 items for needs assessment within six different categories: Curriculum, Teaching and Learning Methods, Instructional Technology, Teaching

Environment, Assessment, and Student Support and Guidance. 44 competence development topics in teaching and learning were gathered under an 'other' entry for each category. This allowed participants to identify needs that were not anticipated by the researcher. The researcher's self-prepared 6-point Likert scale instrument was used (5-High Need, 4-More Need, 3-Moderate Need, 2-Some Need, 1-Lowest Need, 0-No Need).

3.5 Instrument Validity

This research study cautiously developed and provided a valid and reliable 'Faculty Professional Development Survey' using the three previously mentioned instruments. For establishing and testing validity, the following procedures were completed.

The survey was sent to ten experts with a cover letter (see Appendix C) by e-mail for face and content validity. Face validity is to measure whether or not this survey looks like a valuable representation as a research project and content validity evaluates if the items are adequate for the research questions. "Content validity is established by showing that the test items are a sample of a universe in which the investigator is interested" (Cronbach & Meehl, 1955, p. 1). Seven responses were received from the experts. As a result of these responses, some of the survey items were deleted and some item wordings were changed. Negatively worded items were increased in beliefs inventories.

3.6 Procedures

A pilot study was done in EMU to gather information about deficiencies and suggestions to discover application problems. The instrument was printed with a cover letter (see Appendix C) and distributed to ten faculty members from different

disciplines (education, communication, business and management, engineering) and responses were collected. The feedback from these responses helped to make the last changes and finalize the whole survey for distribution. As a result, few the wording of a few explanations was changed to help understanding. Later the survey was re-printed including FNATAL, FBITAL, and FBIICT.

After the pilot study, a booklet including the cover letter, teaching and learning needs topics and beliefs inventories was prepared and printed. The cover letter included a brief paragraph that described the aim and significance of the study. At the end of the cover letter, ethical issues were stated with the names, positions, and signatures of the researcher and the advisor. A brief description of the standardized directions was included at the beginning of each instrument.

The 'Faculty Professional Development Survey' designed to collect data was included in Appendix A. In the first section, there was demographic information about the faculty: gender, academic position, field of study, academic unit (faculty, school, department), and duration of teaching experience. The faculty was then asked whether they would like to attend a professional development activity if it is offered as a result of this study. Blank fields were reserved for the name, telephone number, and e-mail address for those who would like to submit their contact information. Three survey instruments follow demographic information. The first one was the needs assessment, FNATAL. The second and third were beliefs inventories to identify the faculty's professional development needs and beliefs in teaching and learning, FBITAL and FBIICT.

Belief inventories, FBITAL and FBIICT, with demographic information were printed with a cover letter (Appendix C) to be distributed to five universities (Appendix B) including EMU whereas the FNATAL instrument was only used in EMU. The EMU Rector having requested that rectors of the other universities grant their permission, the instruments were given to the contact persons in the administrative units of the four universities to be distributed and collected. Only in Near East University the researcher distributed 200 surveys in person to all the departments. The other 300 surveys were distributed in the four other universities in different locations with the help of their administration. METU NCC, IUC, EUL, and GAU collected and submitted the responses. Near East University (NEU), however, did not permit their faculty to respond the survey and the administration collected the surveys but did not return them to the researcher.

For EMU, the lists of full-time academic staff were taken obtained from the department administrative assistants or downloaded from the official department page on the EMU website. The researcher personally took the booklets to all the departments and distributed them to most of the teaching faculty on the list. The surveys were distributed to a total of 500 members of faculty in EMU, of which 209 (41.8%) valid responses were collected. Some of the departments were visited more than five times to reach faculty who were not available in their offices. Since the researcher is also a senior instructor, in some cases, there were no convenient times to meet faculty for handing in the survey. To overcome this problem, a number of faculty who could not be met were either contacted by phone or e-mail. When this was not possible either, the survey was handed to the department administrative assistant to be given to the faculty. After two weeks, the researcher went to collect

the responses. If the faculty could not be found in their office, an e-mail message was sent. Follow-up telephone calls and e-mail messages were used to contact non-respondents. Although this was an overwhelming process, more than 40% of the data was collected in this way.

3.7 Ethics

The ethics of the research were handled with the utmost care throughout the design, implementation, and collection of the survey instrument and also during contact with the participants. Howe and Moses (1999) emphasize one of the main ethical concerns in education research as the importance of informed consent and privacy (anonymity, confidentiality) for protecting the research participants. The survey information and questions were checked carefully in order to avoid any question about race, gender, rank, etc. When preparing the questions, the privacy and confidentiality of participants were taken into account. The surveys were only distributed to faculty who were willing to participate in the research, since they have the right to decide whether to participate or not by considering the benefits and risks (Howe & Moses, 1999). Participants were also informed and assured that the collected information will be protected from any persons who do not have the authority to see or use it. Within the demographics, one question asks whether faculty would like to attend to a possible professional development activity arrangement in future. The participants who filled in their names and contact information for this part are kept strictly confidential and are not listed in the survey analysis.

Some faculty members were not willing to take the instrument and respond for various reasons. Some of them commented that they did not have sufficient time for

taking part in the survey. Others who displayed a negative attitude towards quantitative research during the survey distribution were not contacted.

Since there is no University Ethics Committee, the EMU Rector's Office and other universities rectorates were contacted to get permission to implement the surveys. In EMU, the researcher visited nearly all faculty offices and distributed the survey showing the permission from the higher administration. In the universities where reliability research took place, after seeking approval from rector, the heads of schools and departments are approached and the researcher handed the surveys according to their directives. In the Middle East Technical University Northern Cyprus Campus (METU NCC), the European University of Lefke (EUL), and the International University of Cyprus (IEC), all the surveys were given to the rector's administrative officer. In Girne American University (GAU), the researcher distributed them to all the departments' administrative assistants with the permission signed by the rector. Although Near East University (NEU) gave verbal permission in the beginning, they later collected the responses but did not return them to the researcher. To overcome this problem may be written permission should have been obtained from rector's office of NEU as it was done in EMU and GAU.

3.8 Data Analysis

All the data collected by quantitative research methods using survey instruments were entered into SPPS for further statistical analyses. In order to construct reliable measurement scales reliability analyses were done. The analysis processes are explained in the following paragraph.

Exploratory factor analysis (EFA) was performed to explore the factors of FBITAL and FBIICT instrument. EFA attempts to discover the nature of the constructs influencing a set of responses (DeCoster, 1998). An estimate of the internal consistency reliability of the FBITAL and FBIICT scale(s) was tested by Cronbach's alpha (Cronbach & Meehl, 1955). A reliability of .70 is usually required for analysis at the group level, and values of .85 and higher for individual use (Steiner & Norman, 1995). Principal components analysis method is a data reduction model which is preferable by some theorists since it uses both shared and unique variances for analyzing (Costello & Osborne, 2005). Also they mention Varimax which is one of the orthogonal methods of rotation, produce factors that are uncorrelated. Principal components analysis method with Varimax rotation model was performed to extract factors in this study. Finally, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is used to test whether the sample sizes are adequate for factor analysis.

An approximation of the internal consistency reliability of the FNATAL was also tested by Cronbach's alpha for the whole instrument before exploratory factor analysis was performed. The categories of faculty members needs for professional development in teaching and learning were classified by exploratory factor analysis. Principal components analysis extraction method and Direct Oblimin with Kaiser Normalization rotation method was performed. Direct Oblimin is an oblique method of rotations that allow the factors to correlate (Costello & Osborne, 2005).

Nonparametric or distribution free tests, as can be derived from the name, are not supposed to devise assumptions about the population besides using the data as ranks of data (referred as 'ranking tests' or 'order tests') (Siegel, 1957). Siegel states that

nonparametric tests are used in conditions where the observations are not drawn from normaly distributed population and when the populations do not have the same variance. Shapiro-Wilk normality test, which is found to be the most powerful normality test (Razali & Wah, 2011) was used to determine the normality of distribution. According to the results of Shapiro-Wilk test, at least one of the groups under comparison had $p < .05$ indicating that data are not obtained from a normally distributed population. Since the distribution was not normal nonparametric tests were preferred for further analyses.

After the confirmation of scales, FBITAL and FBIICT, in terms of validity and reliability, based on the factors extracted as a result of exploratory factor analysis, descriptive statistics of each factor were computed and the results were given. Mean, standard deviation, median, minimum, and maximum was used as descriptive statistics. Their sub scale scores were compared according to gender, academic status, field of study, academic unit, and teaching experience, using Kruskal-Wallis and Mann-Whitney U tests.

For FNATAL first mean, standard deviation, median, and minimum, maximum as descriptive statistics were calculated for each topic in each category. Using these descriptive statistics, the most needed items were listed in descending order. The most and least needed topics in each of six categories were identified. Second, the items with the highest and lowest means were compared in terms of gender, academic status, field of study, academic unit, and teaching experience using Kruskal-Wallis and Mann-Whitney U tests. Kruskal-Wallis test conducted on ranked scores evaluates the differences between medians among different groups using K-

independent samples, whereas Mann-Whitney U is used to compare differences between two independent groups.

Spearman's correlation analysis was used to find the correlation among beliefs in professional development in teaching and learning (FBITAL), beliefs in ICT-based professional development (FBIICT) and needs for professional development (FNATAL).

3.9 Reliability

In the following part validity and reliability of Faculty Beliefs in Professional Development in Teaching and Learning (FBITAL) and Faculty Beliefs in ICT-based Professional Development (FBIICT) inventories will be explained.

3.9.1 FBITAL Preliminary Reliability Analysis

Analysis was done using 343 valid faculty member received responses to 22 questions. Item statistics results at the beginning are shown in Table 3. As a result of examining correlation between item and total points it was found that all items had positive correlation with total score. Cronbach α value is widely used in reliability check and the ideal value is Cronbach $\alpha \geq .70$. For one-factored FBITAL scale, the Cronbach α was obtained as .718, exhibiting that there was no need for deleting any items. Although deleting item FBITAL09 would increase Cronbach α value to .742, since the overall reliability value was above .70 at this point there was no need for deleting any item.

3.9.2 FBITAL Factor Analysis

Exploratory factor analysis (EFA) was done with 22 items to check the constructs of the FBITAL beliefs inventory. It was conducted to discover whether items fit to the

Table 3: FBITAL Item Total Statistics

	Scale Mean if item is deleted	Scale Variance if item is deleted	Corrected Item-Total correlation	Cronbach Alpha if item is deleted
FBITAL01	72.15	53.022	.317	.705
FBITAL02	72.33	51.046	.468	.693
FBITAL03	73.54	55.891	.009	.738
FBITAL04	72.68	50.825	.430	.695
FBITAL05	72.18	51.423	.460	.695
FBITAL06	72.20	51.228	.440	.695
FBITAL07	74.23	56.350	.010	.732
FBITAL08	72.32	50.743	.438	.694
FBITAL09	74.54	58.492	-.129	.742
FBITAL10	72.61	51.567	.387	.699
FBITAL11	74.54	55.265	.081	.726
FBITAL12	74.25	57.163	-.040	.735
FBITAL13	72.27	52.190	.438	.698
FBITAL14	72.41	51.822	.485	.695
FBITAL15	72.75	51.277	.337	.703
FBITAL16	72.14	50.460	.551	.688
FBITAL17	72.31	51.282	.534	.691
FBITAL18	72.25	52.178	.478	.696
FBITAL19	72.32	51.023	.559	.689
FBITAL20	73.91	55.682	.039	.732
FBITAL21	74.54	57.610	-.068	.737
FBITAL22	72.22	51.838	.420	.698

fixed two-factor structure distinguished as positive and negative beliefs towards professional development in teaching and learning. Principal components analysis method with Varimax rotation model was performed to extract two factors from 22 items. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy which is used to test appropriateness of factor analysis was found to be .881 where values between .5 and 1.0 are considered as adequate to correlate (Hinton, Brownlow, & McMurray, 2004). Bartlett's Test of Sphericity was found to be χ^2 (231, N = 343) = 2180.602, *p*

= .000 < .05. The relationships between the variables were suitable to continue with factor analysis since $p < .05$ (Hinton et al., 2004).

As a result of EFA in categorical data all items were in harmony as displayed in the rotated component matrix (Table 4). The 15 items that were loaded in Factor 1 were FBITAL01, FBITAL02, FBITAL04, FBITAL05, FBITAL06, FBITAL08, FBITAL10, FBITAL13, FBITAL14, FBITAL15, FBITAL16, FBITAL17, FBITAL18, FBITAL19, and FBITAL22. Factor 1 was identified as **'Enthusiastic beliefs'** about professional development in teaching and learning. Seven items FBITAL03, FBITAL07, FBITAL09, FBITAL11, FBITAL12, FBITAL20, and FBITAL21 were loaded into Factor 2 identified as **'Apathetic beliefs'** about professional development in teaching and learning. All items were loaded as greater than .443 on relevant factors and were retained. Item loadings above .30 are accepted for cleanest factor loading structure (Costello & Osborne, 2005).

Investigation results of the items that fall into apathetic beliefs were in parallel with the study of Lackritz (2004) who examined burnout and related issues in higher education. He mentioned some conceptions among higher education faculty such as teaching overload, number of students, numerical evaluations which may cause loss of energy, job dissatisfaction, and feeling personal deficiency. So, seven apethetic beliefs may be articulated as a result of faculty burnout in academic life, which are not reflected in accord in the survey.

Table 4: Factor loadings of FBITAL items

Items		Factor 1	Factor 2
FBITAL01	Professional development empowers faculty members with skills for effective education from the beginning of their career until retirement	0.487	
FBITAL02	Faculty members' attendance at professional development activities will improve students' quality of learning	0.611	
FBITAL04	I benefit from my colleagues' opinions and evaluation on my teaching	0.586	
FBITAL05	I am interested in learning and using more effective methods to teach my courses	0.645	
FBITAL06	Faculty members should value excellence in teaching	0.574	
FBITAL08	Faculty members have to use Internet and computer technologies for professional development in teaching	0.599	
FBITAL10	I am interested in participating in professional development activities offered by expert faculty members	0.585	
FBITAL13	Reading books, training materials, and other sources on teaching and learning will develop my teaching	0.588	
FBITAL14	Informal conversations with my colleagues about teaching give me ideas for making adaptations in my courses	0.631	
FBITAL15	Students' evaluation of my teaching are useful to adjust my teaching strategy	0.494	
FBITAL16	Faculty members' professional development in teaching and learning will improve the quality of education at the university	0.748	
FBITAL17	Faculty members can develop their courses by doing research and implementing the results	0.673	
FBITAL18	Collaboration among faculty members about teaching and learning helps their professional development	0.683	
FBITAL19	Professional development activities and resources empower faculty members	0.741	
FBITAL22	In this knowledge age, I should follow changes in theories, methods, technologies, and new paradigms of teaching and learning	0.612	
FBITAL03	I am already too overloaded so I do not have time to participate in professional development activities		0.520
FBITAL07	I do not have energy for attending professional development activities		0.646
FBITAL09	There is no need to use special teaching methods in classroom since it is the students' responsibility to learn		0.645
FBITAL11	Teaching is not a special skill, so everyone who is knowledgeable in a discipline can teach		0.463
FBITAL12	I am already a good teacher so I do not need to improve my teaching		0.676
FBITAL20	Graduate training is sufficent for a new faculty member to become a good teacher		0.443
FBITAL21	There is no advantage of discussing issues and problems about teaching and learning with a group of colleagues		0.589
% of variance explained		27.0	12.0

The scree plot is a graph drawn with the corresponding eigenvalues of components, useful in determining the number of components to extract (Hinton et al., 2004). Figure 2 displays that two major factors were extracted.

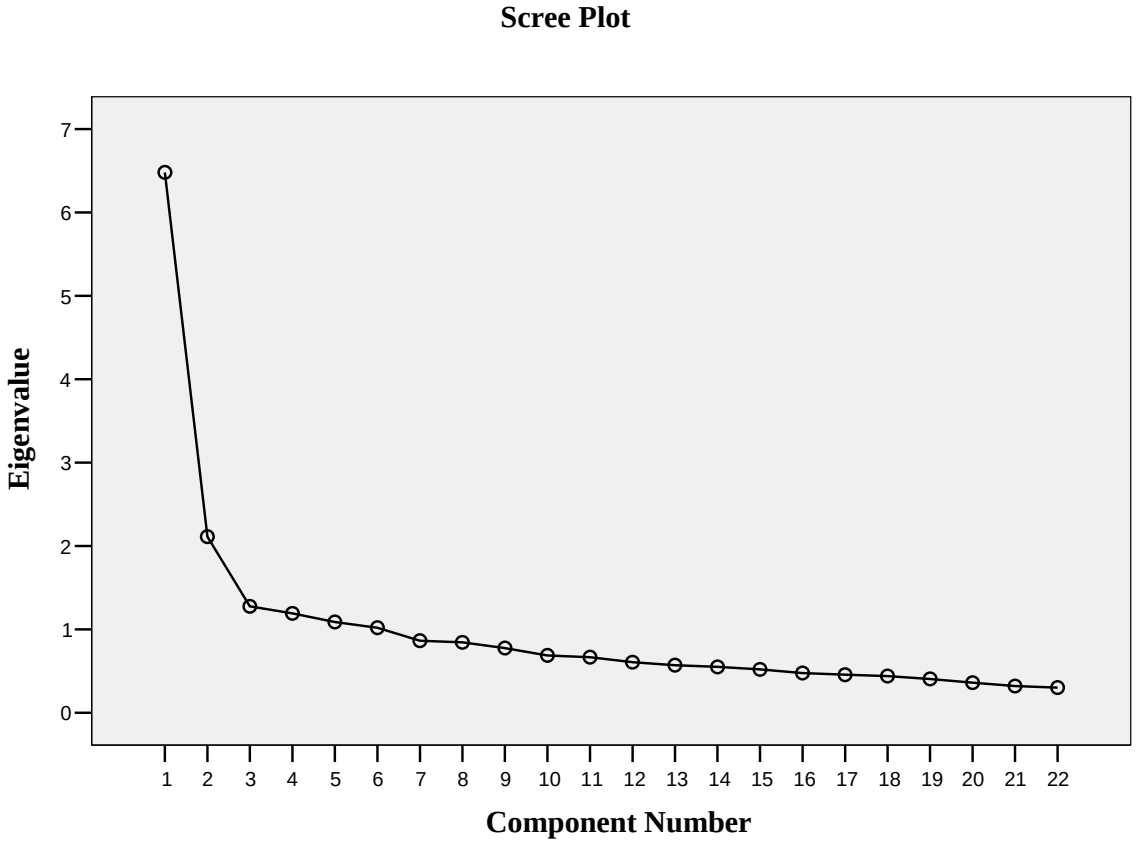

Figure 2. Scree plot of FBITAL

The component plot in rotated space is shown in Figure 3 which also identifies a clear separation of the factors (Hinton, Brownlow, & McMurray, 2004). The x-axis shows the enthusiastic belief items where the y-axis of the plot shows the apethetic beliefs of all nodes that are included in the whole component.

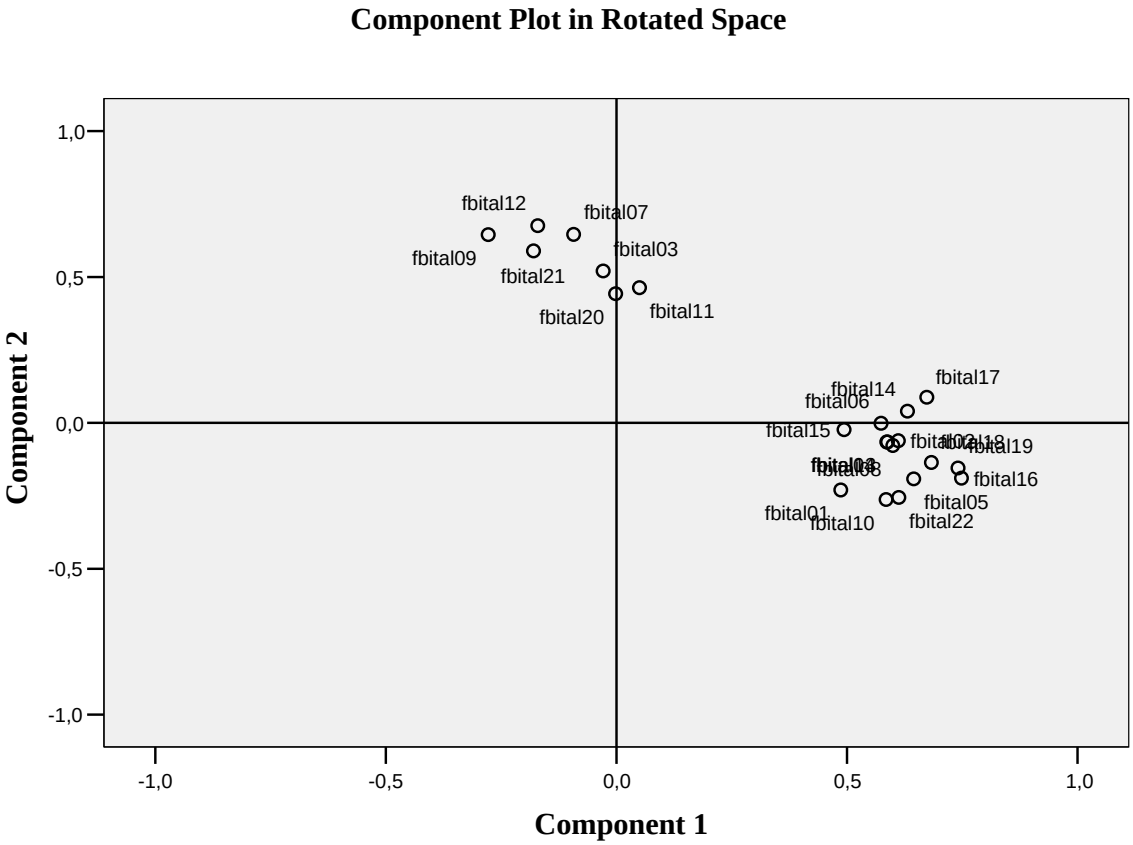

Figure 3. Component plot of FBITAL

3.9.3 FBITAL Final Reliability Analysis

For the two-factor structure, 15 items in Factor 1 have a Cronbach α value of 0.885; and for 7 items in Factor 2 the Cronbach α value is 0.669 as displayed in Table 7.

3.9.4 FBIICT Preliminary Reliability Analysis

Analysis was done from 343 valid faculty member responses received to 17 questions. Item statistics results at the beginning, is shown in Table 5. As a result of examining correlation between item and total points it is found that all items had positive correlation with total score. For one-factored FBITAL scale, the Cronbach α was obtained as .593.

Table 5: FBIICT Item Total Statistics

	Scale Mean if item is deleted	Scale Variance if item is deleted	Corrected Item-Total correlation	Cronbach Alpha if item deleted
FBIICT01	52.97	27.384	.358	.559
FBIICT02	53.98	28.724	.074	.606
FBIICT03	53.27	27.125	.400	.553
FBIICT04	53.06	27.796	.277	.569
FBIICT05	53.42	27.038	.360	.556
FBIICT06	53.36	27.399	.291	.566
FBIICT07	54.32	28.956	.078	.602
FBIICT08	54.80	29.464	.039	.607
FBIICT09	54.69	29.329	.062	.603
FBIICT10	53.15	27.942	.294	.568
FBIICT11	53.43	27.178	.343	.559
FBIICT12	54.63	29.547	.018	.613
FBIICT13	54.31	28.775	.102	.598
FBIICT14	53.50	26.738	.346	.556
FBIICT15	53.94	26.540	.305	.562
FBIICT16	53.42	27.888	.289	.568
FBIICT17	53.84	27.913	.262	.571

3.9.5 FBIICT Factor Analysis

Exploratory factor analysis (EFA) was done with 17 items. As a result of EFA in categorical data all items were in harmony except for item 2 which was suppressed since its absolute value was less than .35. Tabachnick and Fidell (2001) recommend absolute value less than .32. The relevant item deleted was 2: *'My biggest obstacle to learning with new technologies is not finding sufficient time to spare'*. During the survey process there was a dispute about the wording of this item. Its sentence structure in English seemed to have created a bias with the intended meaning in Turkish. The discord can be a result of different respondents attributing conflicting meanings.

The items were loaded highly onto the two-factor model (Table 6) distinguished as positive and negative beliefs towards ICT-based professional development in teaching and learning. Principal components analysis method with Varimax rotation model was performed to extract two factors from 17 items. Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy which is used to test appropriateness of factor analysis was found to be .843 which was suitable to correlate. Bartlett's Test of Sphericity was found to be χ^2 (120, N = 343) = 1346.357, p = .000 < .05 showing that the relationship between the variables were suitable to continue with factor analysis.

As displayed in Table 6, eleven belief items, FBIICT01, FBIICT03, FBIICT04, FBIICT05, FBIICT06, FBIICT10, FBIICT11, FBIICT14, FBIICT15, FBIICT16, and FBIICT17 belong to Factor 1. Five belief items FBIICT07, FBIICT08, FBIICT09, FBIICT12, and FBIICT13 form Factor 2. After the lexical and semantic analysis of the items that formed Factor 1 and Factor 2. The first factor groups the items which refer to ICT as supportive, facilitating, convenient, and assistive tools for professional development in teaching and learning. The items grouped under the second factor were mostly those which refer to ICT as inconvenient, obstacles or hinders. Factor 1 will therefore be called **'ICT as assistive technology'**, and Factor 2 **'ICT as hindering technology'**. According to Feyerer, Miesenberger and Wohlhart (2002), "The term Assistive Technology (AT) basically describes all kind of tools, devices or systems enabling a person to (easier and safer) perform a task." (p. 297).

Table 6: Factor loadings of FBIICT items

Items		Factor 1	Factor 2
FBIICT01	Using ICT (computers, Internet, etc.) facilitates faculty members' professional development	.618	
FBIICT03	Participating in ICT-based professional development activities enhances my use of technology	.669	
FBIICT04	ICT has the potential of great flexibility for learning anytime, anywhere, and at any pace	.562	
FBIICT05	Watching videos or animations about teaching approaches is a convenient way of learning for faculty members	.621	
FBIICT06	Mailing lists (Listservs, Newsgroups, etc.) are important tools for exchanging ideas with colleagues	.582	
FBIICT10	Professional online networks facilitate global collaboration with colleagues from all over the world	.617	
FBIICT11	Sharing my ideas or problems on teaching and learning on online media helps me get feedback	.630	
FBIICT14	Recording and watching videos about my teaching helps me develop in teaching and learning	.597	
FBIICT15	Social networks (Facebook, Twitter, LinkedIn, MyNet, etc.) create opportunities for faculty members to disseminate professional opinions informally	.520	
FBIICT16	ICT allow me to choose the learning materials according to my competence and my learning style	.561	
FBIICT17	Social bookmarking services (Delicious, Diigo, etc.) which facilitate keeping and sharing links to resources help my professional development	.484	
FBIICT07	It is rather difficult for me to participate in online professional development activities		.683
FBIICT08	Using slides, videos, and podcasts prepared by expert faculty members cannot help my professional development		.610
FBIICT09	Web-based learning environments are not practical for me for professional development		.741
FBIICT12	E-mails, chat programs, Skype, instant messaging, etc. are not suitable for me to communicate for professional development purposes		.664
FBIICT13	I don't have a preference to participate in online conferences although there is no need to travel		.735
% of variance explained		24.4	18.0

The scree plot graph that enclosed the corresponding eigenvalues of the components resulted in extracting two major factors (Figure 4).

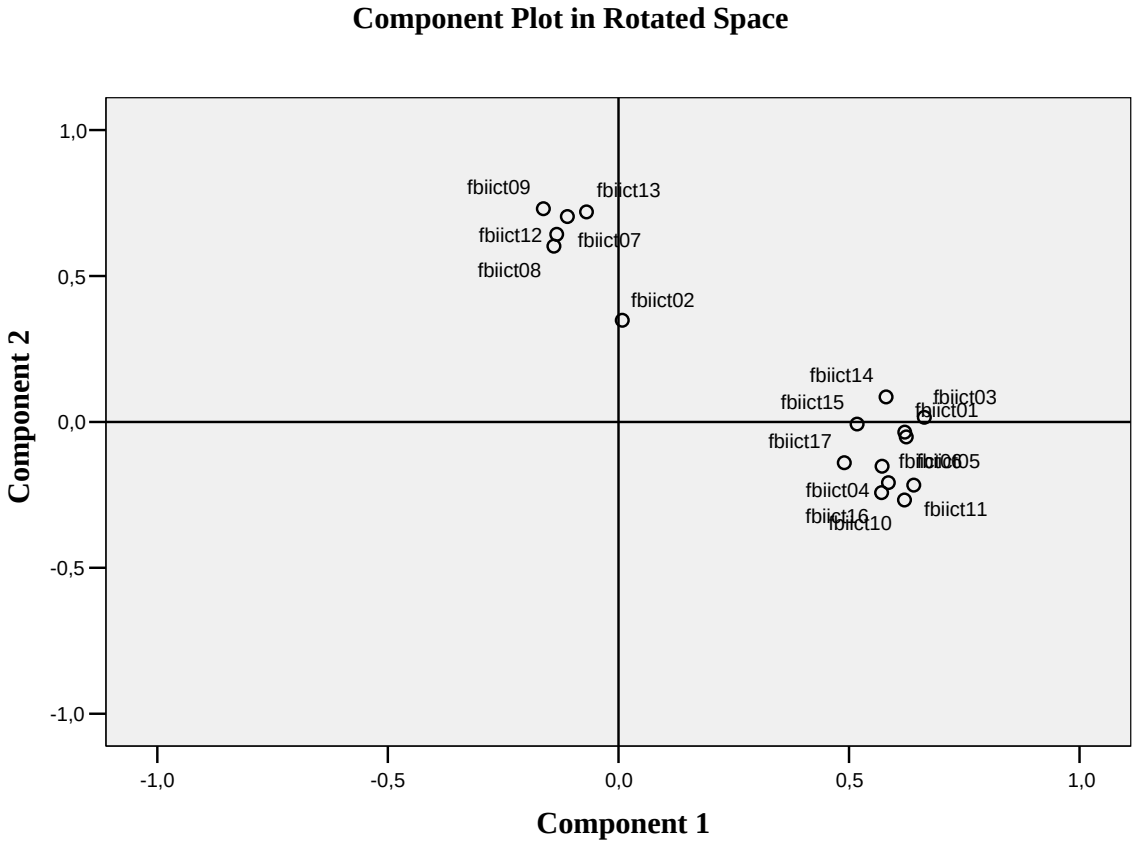

Figure 4. Scree plot of FBIICT

The component plot in rotated space is shown in Figure 5 which also identifies a clear separation of the factors. The x-axis shows the items related to beliefs about ICT as assistance where the y-axis of the plot shows beliefs about ICT as hinderance, of all nodes that are included in the whole component.

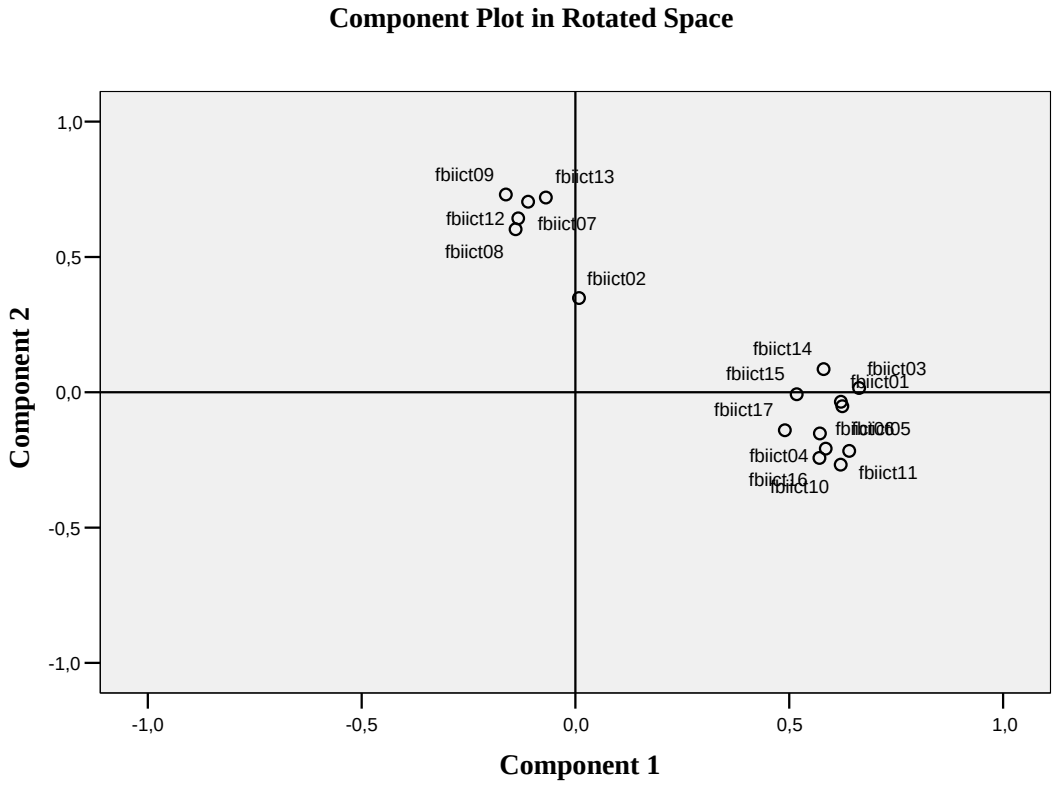

Figure 5. Component plot of FBIICT

3.9.6 FBIICT Final Reliability Analysis

Cronbach α value is widely used in reliability check and the ideal value is Cronbach α ≥ .70. For the two-factor structure, 11 items in Factor 1 have a Cronbach α value of .818; and for 5 items in Factor 2 the Cronbach α value is .738 (Table 7).

Table 7: Reliability test results for FBITAL and FBIICT

Items		Number of items	Cronbach Alpha
FBITAL (α = 0.72)			
Factor 1	Enthusiastic	15	0.89
Factor 2	Apathetic	7	0.67
FBIICT (α = 0.61)			
Factor 1	ICT as assistive technology	11	0.82
Factor 2	ICT as hindering technology	5	0.74

3.9.7 FNATAL Preliminary Reliability Analysis

Analysis was done using 209 valid EMU faculty members' received responses to 44 questions. Item statistics results at the beginning are shown in Table 8. Before exploratory factor analysis was performed, Cronbach's alpha for the whole instrument was calculated as .984 which implies a very high reliability of the instrument.

3.9.8 FNATAL Factor Analysis

The items were loaded highly onto the six-factor model (Table 9). Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was found to be .954 where values between .5 and 1.0 are considered as adequate to correlate. Bartlett's Test of Sphericity was found to be χ^2 (946, N = 209) = 7863.366, p = .000 < .05 which is suitable to continue with factor analysis.

As a result of exploratory factor analysis using Principal components analysis extraction method and Direct Oblimin with Kaiser Normalization rotation method, six factors for six predefined categories are extracted from 44 items. All items except item FNATAL14 '*Teaching in various setting (laboratory, studio, small and large*

classes)' were loaded as greater than .335 on relevant factors and were retained. Item loadings above .30 are accepted for cleanest factor loading structure (Costello & Osborne, 2005).

Table 8: FNATAL Item Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
FNATAL01	113.62	3295.700	.722	.984
FNATAL02	113.49	3267.893	.861	.983
FNATAL03	113.58	3266.893	.850	.983
FNATAL04	113.65	3294.932	.751	.984
FNATAL05	113.44	3281.682	.825	.983
FNATAL06	113.64	3288.396	.763	.984
FNATAL07	113.60	3283.539	.793	.984
FNATAL08	113.62	3288.100	.783	.984
FNATAL09	113.58	3281.597	.783	.984
FNATAL10	113.69	3271.828	.845	.983
FNATAL11	113.90	3299.025	.713	.984
FNATAL12	113.33	3277.381	.832	.983
FNATAL13	113.41	3302.451	.741	.984
FNATAL14	113.61	3266.681	.812	.983
FNATAL15	113.73	3292.380	.817	.983
FNATAL16	113.60	3285.662	.772	.984
FNATAL17	113.59	3299.651	.713	.984
FNATAL18	113.53	3325.588	.537	.984
FNATAL19	113.87	3364.128	.384	.984
FNATAL20	113.89	3364.278	.405	.984
FNATAL21	113.81	3374.501	.330	.985
FNATAL22	113.75	3270.646	.810	.983
FNATAL23	113.66	3282.158	.825	.983
FNATAL24	113.55	3279.146	.823	.983
FNATAL25	113.45	3268.511	.848	.983
FNATAL26	113.72	3253.376	.851	.983
FNATAL27	113.59	3248.092	.863	.983
FNATAL28	113.66	3252.211	.860	.983
FNATAL29	113.63	3259.407	.814	.983
FNATAL30	113.53	3291.492	.756	.984
FNATAL31	113.79	3266.251	.849	.983
FNATAL32	114.01	3281.690	.784	.984
FNATAL33	113.98	3280.103	.818	.983
FNATAL34	113.88	3259.510	.850	.983
FNATAL35	114.25	3289.691	.697	.984
FNATAL36	114.25	3312.477	.662	.984
FNATAL37	113.87	3290.997	.790	.984
FNATAL38	113.83	3284.984	.872	.983
FNATAL39	113.62	3307.312	.744	.984
FNATAL40	113.93	3306.381	.760	.984
FNATAL41	113.81	3275.287	.795	.984
FNATAL42	113.66	3291.549	.784	.984
FNATAL43	113.17	3305.205	.685	.984
FNATAL44	113.36	3281.957	.746	.984

Table 9: Factor loadings and Cronbach α values for needs categories

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Curriculum, α = .949						
FNATAL01	.873					
FNATAL02	.590					
FNATAL03	.656					
FNATAL04	.868					
FNATAL05	.683					
Teaching and Learning Methods, α = .951						
FNATAL06		.617				
FNATAL07		.375				
FNATAL08		.567				
FNATAL09		.626				
FNATAL10		.612				
FNATAL11		.698				
FNATAL12		.387				
FNATAL13		.501				
FNATAL15		.462				
Instructional Technology, α = .883						
FNATAL16			.444			
FNATAL17			.567			
FNATAL18			.699			
FNATAL19			.898			
FNATAL20			.891			
FNATAL21			.878			
Teaching Environment, α = .972						
FNATAL22				.613		
FNATAL23				.347		
FNATAL24				.476		
FNATAL25				.390		
FNATAL26				.704		
FNATAL27				.761		
FNATAL28				.694		
FNATAL29				.688		
FNATAL30				.871		
FNATAL31				.764		
FNATAL32				.453		
FNATAL33				.608		
FNATAL34				.444		
Assessment, α = .811						
FNATAL35					.625	
FNATAL36					.586	
FNATAL37					.338	
Student Support and Guidance, α = .937						
FNATAL38						.344
FNATAL39						.735
FNATAL40						.626
FNATAL41						.660
FNATAL42						.728
FNATAL43						.430
FNATAL44						.760
% of variance explained	2.0	4.2	7.1	60.6	2.4	2.7
Overall α = .983						

3.9.9 FNATAL Final Reliability Analysis

Cronbach α value is widely used in reliability check and the ideal value is Cronbach $\alpha \geq .70$. The factor loadings and Cronbach's alpha values for needs categories are shown in Table 9. For six-factored FNATAL scale, the obtained Cronbach α for each factor is displaying high reliability.

Chapter 4

ANALYSIS AND FINDINGS

The findings of the study will be presented in the following three subsections: identification of findings related to beliefs for professional development in teaching and learning and beliefs for ICT-based professional development in teaching and learning, identification of findings related to needs in professional development in teaching and learning, and the relationship between beliefs and needs.

4.1 Findings of Beliefs

In this section, the overall results for belief inventories FBITAL and FBIICT, and comparison of both beliefs with respect to demographic variables will be given.

4.1.1 Findings of Beliefs about Professional Development (FBITAL)

Research Question 1 concerning whether faculty members believe in professional development in teaching and learning was first investigated. The mean (±standard deviation) [median (minimum-maximum)] FBITAL score for **Factor 1** items that state **'Enthusiastic beliefs'** was 4.04 (±0.53) [4 (1.80-5)], and **Factor 2** items that state **'Apathetic beliefs'** was 2.27 (±0.67) [2.17 (1-5)]. This finding shows that EMU faculty members' enthusiastic beliefs about professional development were in the 'Agree' part of the Likert scale. EMU faculty members believe that professional development in teaching and learning is important. This is an encouraging result since, as Cafferalla and Zinn (1999) mention, strongly believing and valuing are significant facilitators for professional development. Likewise, Johnson et al. (1998)

discovered that most of the faculty (94.4%) in their study strongly believed in attending professional development activities on a specific topic as performance-based assessment. The beliefs which were exposed as apathetic beliefs were little more than disagreeing towards being neutral. These results indicate that, overall, faculty exhibit passion strongly and anxiety weakly for professional development purposes in teaching and learning.

4.1.2 Relationship between Beliefs for Professional Development (FBITAL) and Demographics

This part considers the findings related to Research Question 2 which investigates whether faculty beliefs in professional development in teaching and learning vary with respect to demographic variables. For this purpose, the total FBITAL Factor 1 and Factor 2 scores of each participant was computed consequently from 15 and 8 items.

Table 10: Descriptive statistics of FBITAL scores by gender

Gender	N	Mean±SD	Median (Min- Max)
		Enthusiastic	
Female	87	4.05±0.59	4.0 (2-5)
Male	117	4.03±0.47	4.0 (3-5)
Overall	204	4.04±0.52	4.0 (2-5)
		Apathetic	
Female	88	2.22±0.61	2.2 (1-4)
Male	117	2.32±0.71	2.3 (1-5)
Overall	205	2.28±0.67	2.2 (1-5)

Gender Aspect

The difference in faculty beliefs with regard to gender was analyzed. Table 10 shows that for enthusiastic belief scores of females and males were $M = 4.05$ and $M = 4.03$,

respectively. Apathetic beliefs mean scores are $M = 2.22$ for females and $M = 2.32$ for males.The difference was found not to be statistically significant for both enthusiastic beliefs ($p = .340 > .05$) and for apathetic beliefs ($p = .364 > .05$). The results indicate that, in EMU, both female and male faculty members believe in professional development to a very similar extent.

Academic Position Aspect

Next, beliefs in professional development in teaching and learning with regard to academic position are investigated. Table 11 summarizes the mean belief scores of professors ($M = 4.10$), both associate professors and assistant professors ($M = 3.99$), and instructors and lecturers ($M = 4.11$) for Factor 1. The belief scores for Factor 2 are professors ($M = 2.48$), assistant professors ($M = 2.37$), instructors and lecturers

Table 11: Descriptive statistics of FBITAL scores by academic position

Academic position	N	Mean±SD	Median (Min- Max)
		Enthusiastic	
Professor	27	4.10±0.50	3.0 (3-5)
Associate Professor	36	3.99±0.53	4.0 (3-5)
Assistant Professor	60	3.99±0.48	4.0 (3-5)
Instructor/Lecturer	81	4.11±0.81	4.1 (2-5)
Overall	204	4.05±0.50	4.0 (2-5)
		Apathetic	
Professor	27	2.48±0.61	2.6 (1-4)
Associate Professor	36	2.17±0.63	2.1 (1-4)
Assistant Professor	61	2.37±0.72	2.3 (1-5)
Instructor/Lecturer	81	2.18±0.65	2.0 (1-4)
Overall	205	2.28±0.67	2.3 (1-5)

(M = 2.18), and associate professors (M = 2.17). Similar to gender, there was no statistically significant difference in enthusiastic (p = .366 > .05) and apathetic (p = .063 > .05) beliefs with respect to academic positions on the basis of beliefs scores.

Field of Study Aspect

Next, the difference between faculty members' beliefs about teaching and learning with respect to their field of studies was examined. Having only one participant resulted Fine and Performing Arts being excluded from the analysis. As the results are displayed in Table 12, members of faculty with the highest enthusiastic belief scores in professional development in teaching and learning were from the fields of Engineering (M = 4.15). Those who reported the least enthusiastic beliefs were faculty in the field of Tourism and Hospitality Management (M = 3.89). There is no statistically significant difference in depending on field of study (p = .539 > .05) for Factor 1, indicating that there is no difference in enthusiastic belief scores that can be taken into account between fields of studies. Lowest apathetic belief scores were found as faculty members in Teacher Education (M = 2.00) and highest were faculty members in Physical and Natural Sciences (M = 2.58). Similar to Factor 1, Factor 2 scores has no statistically significant difference according to fields of study (p = .105 > .05). This claims that apathetic belief scores do not differ according to faculty members from different fields of study.

Academic Unit Aspect

Next, it was investigated whether there is a difference in belief scores depending on the faculty, school, or department in which faculty works. The Applied Sciences Department was excluded from the analysis since there was only one participant. Table 13 summarizes the means of belief scores by academic unit where faculty

Table 12: Descriptive statistics of FBITAL scores by field of study

Field of study	N	Mean±SD	Median (Min-Max)
Enthusiastic			
Architecture	12	3.97±0.55	3.9 (3-5)
Business & Economics	19	4.03±0.45	4.0 (3-5)
Communication & Media Studies	20	4.00±0.55	3.9 (3-5)
Computing & Technology	21	4.13±0.43	4.1 (3-5)
Engineering	37	4.15±0.46	4.1 (3-5)
Humanities	11	4.06±0.52	4.3 (3-5)
Physical & Natural Sciences	17	3.96±0.51	3.9 (3-5)
Social & Behavioral Sciences	19	4.00±0.51	3.8 (3-5)
Teacher Education	33	4.07±0.72	4.1 (2-5)
Tourism & Hospitality Management	13	3.88±0.42	3.9 (3-5)
Overall	202	4.05±0.53	4.0 (2-5)
Apathetic			
Architecture	12	2.37±0.71	2.3 (2-4)
Business & Economics	19	2.30±0.82	2.3 (1-4)
Communication & Media Studies	20	2.12±0.57	2.2 (1-3)
Computing & Technology	21	2.22±0.75	2.0 (1-4)
Engineering	37	2.39±0.62	2.3 (1-4)
Humanities	11	2.09±0.67	2.0 (1-3)
Physical & Natural Sciences	17	2.58±0.54	2.4 (1-4)
Social & Behavioral Sciences	20	2.34±0.77	2.3 (1-5)
Teacher Education	33	2.00±0.52	1.9 (1-3)
Tourism & Hospitality Management	13	2.42±0.71	2.3 (1-4)
Overall	203	2.27±0.67	2.2 (1-5)

members work. According to this table, faculty members from the School of Computing and Technology ($M = 4.16$) displayed the strongest enthusiastic beliefs.

Table 13: Descriptive statistics of FBITAL scores by academic unit

Academic Unit	N	Mean±SD	Median (Min-Max)
Enthusiastic			
Architecture	13	3.98±0.53	4.0 (3-5)
Arts & Sciences	35	3.97±0.51	3.9 (3-5)
Business & Economics	21	4.01±0.46	4.0 (3-5)
Communication & Media Studies	17	4.02±0.51	3.9 (3-5)
Computing & Technology	28	4.16±0.43	4.1 (3-5)
Education	39	4.11±0.70	4.2 (2-5)
Engineering	30	4.10±0.48	4.0 (3-5)
Law	5	4.04±0.59	3.9 (4-5)
Tourism & Hospitality Management	14	3.93±0.44	4.0 (3-5)
Overall	202	4.05±0.53	4.0 (2-5)
Apathetic			
Architecture	13	2.35±0.69	2.1 (2-4)
Arts & Sciences	35	2.36±0.58	2.3 (1-4)
Business & Economics	22	2.45±0.88	2.4 (2-5)
Communication & Media Studies	17	2.12±0.50	2.1 (1-3)
Computing & Technology	28	2.27±0.80	2.0 (1-4)
Education	39	1.95±0.54	1.9 (1-3)
Engineering	30	2.40±0.62	2.4 (1-4)
Law	5	2.20±0.28	2.3 (2-3)
Tourism & Hospitality Management	14	2.48±0.72	2.4 (1-4)
Overall	203	2.27±0.69	2.1 (1-5)

In the School of Tourism and Hospitality Management, members of faculty believe least ($M = 3.93$). There is no statistically significant difference in beliefs of faculty

among different academic units based on FBITAL scores (p = .609 > .05) in enthusiastic beliefs. Similarly no statistically significant difference can be found in apathetic beliefs (p = .087 > .05). Lowest apathetic beliefs were from faculty of Education (M = 1.95) and highest from Tourism and Hospitality Management (M = 2.48). Parallel to the findings for field of study, the academic units where faculty works do not make a difference in their both enthusiastic and apathetic beliefs.

Teaching Experience Aspect

Last, differences of FBITAL scores were examined with regard to teaching experience (Table 14). The results display that faculty who has teaching experience from 15 to 21 years had the strongest enthusiastic beliefs (M = 4.12) and has the lowest apathetic beliefs (M = 2.20). Other than this faculty having 8-14 years of experience (M = 3.96) have lowest enthusiastic and over 21 years (M = 4.12) have

Table 14: Descriptive statistics of FBITAL scores by teaching experience

Teaching experience	N	Mean±SD	Median (Min-Max)
		Enthusiastic	
1-7 years	40	4.06±0.54	4.1 (3-5)
8-14 years	55	3.96±0.55	3.9 (2-5)
15-21 years	56	4.12±0.46	4.0 (3-5)
Over 21 years	53	4.04±0.57	4.1 (2-5)
Overall	204	4.04±0.53	4.0 (2-5)
		Apathetic	
1-7 years	40	2.27±0.76	2.2 (1-4)
8-14 years	56	2.25±0.71	2.1 (1-5)
15-21 years	56	2.20±0.65	2.1 (1-4)
Over 21 years	54	2.37±0.57	2.4 (1-4)
Overall	206	2.27±0.67	2.1 (1-5)

highest apathetic beliefs. Although the results indicate that there is no statistically significant difference in beliefs depending on teaching experience according to enthusiastic beliefs FBITAL scores ($p = .511 > .05$) and apathetic beliefs FBITAL scores ($p = .236 > .05$).

All of the results in this part show that, in EMU, faculty beliefs about professional development in teaching and learning do not vary according to any of the faculty demographics considered, namely, gender, academic rank, field of study, academic unit, and teaching experience.

4.1.3 Findings of Beliefs about ICT-based Professional Development (FBIICT)

This part aims to answer Research Question 6 to explore whether faculty believe in ICT-based professional development in teaching and learning. Beliefs about technology are also investigated so that it will not to be an obstacle to ICT-based professional development. The mean (±standard deviation) [median (minimum-maximum)] FBIICT score for **Factor 1** items that state **'ICT as assistive technology'** was 3.70 (±0.53) [3.73 (1-5)], and **Factor 2** items that state '**ICT as hindering technology'** was 2.76 (±0.67) [2.67 (1-5)]. ICT as assistive technology belief score is more than average and very close to the 'Agree' side of the scale displaying acceptance for ICT-based professional development. However, beliefs about hinderance of ICT were on the disagreeing side of the scale close to neutral. These results indicate that, overall, faculty display stronger belief for items that provide assistance and display weak beliefs for items that provide hinderance to the use of ICT for professional development purposes in teaching and learning.

4.1.4 Relationship between ICT-based Professional Development (FBIICT) and Demographics

To respond to Research Question 7, an analysis of faculty's beliefs about ICT-based professional development in teaching and learning and their variation with regard to demographic variables was completed.

Gender Aspect

The first step checks whether faculty beliefs scores varied with respect to gender. As can be seen in Table 15, for Factor 1, the female faculty beliefs score mean is M = 3.70 and the male equivalent is M = 3.69. Factor 2 beliefs mean scores are M = 2.73 for females and M = 2.78 for males. Further analysis identified that there is no statistically significant difference between female and male faculty neither in assistance of ICT scores (p = .891 > .05) nor in hinderance of ICT scores (p = .660 >

Table 15: Descriptive statistics of FBIICT scores by gender

Gender	N	Mean±SD	Median (Min- Max)
ICT as assistive technology			
Female	88	3.70±0.47	3.7 (3-5)
Male	118	3.69±0.58	3.7 (1-5)
Overall	206	3.70±0.53	3.7 (1-5)
ICT as hindering technology			
Female	88	2.73±0.65	2.7 (1-4)
Male	117	2.78±0.69	2.8 (1-5)
Overall	205	2.76±0.67	2.8 (1-5)

.05). Both female and male faculty members believe in ICT-based professional development (either assistive or hindering) at a very similar level.

Academic Position Aspect

The difference in the faculty members' ICT-based belief scores in regards to academic positions is analyzed. Table 16 summarizes the situation where the instructors and lecturers have M = 3.75 the highest belief scores for Factor 1. Although, as a result of FBIICT scores (p = .664 > .05) there is no significant difference between beliefs in ICT as assistive technology with respect to academic positions.

Table 16: Descriptive statistics of FBIICT scores by academic position

Academic position	N	Mean±SD	Median (Min- Max)
ICT as assistive technology			
Professor	27	3.72±0.59	3.6 (2-5)
Associate Professor	36	3.64±0.53	3.7 (3-5)
Assistant Professor	62	3.65±0.60	3.6 (1-5)
Instructor/Lecturer	81	3.75±0.43	3.8 (3-5)
Overall	206	3.70±0.52	3.7 (1-5)
ICT as hindering technology			
Professor	27	2.94±0.58	3.0 (2-5)
Associate Professor	36	2.84±0.64	2.8 (1-4)
Assistant Professor	61	2.78±0.69	2.8 (1-5)
Instructor/Lecturer	81	2.66±0.69	2.7 (1-5)
Overall	205	2.76±0.67	2.8 (1-5)

On the other hand, the instructors and lecturers have M = 2.66, the lowest FBIICT Factor 2 scores. Again, beliefs about ICT hinderance show no statistically significant

difference (p = .187 > .05) in regards to their academic positions. Remarkably, instructors and lecturers have concurently reported the highest belief in ICT as assistive technology and the lowest belief in ICT as hindering technology for professional development.

Field of Study Aspect

Next, variation among beliefs about ICT-based professional development with regard to faculty members' field of studies was investigated. Having only three participants resulted Fine and Performing Arts being excluded from the analysis. The results of descriptive statistics of beliefs about ICT-based professional development according to fields of study are displayed in Table 17. The highest Factor 1 scores were from the Business and Economics field (M = 3.91) and the lowest (M = 3.56) from Social and Behavioral Sciences and Physical and Natural Sciences. There was no statistically significant difference between belief scores of ICT as assistive technology with respect to field of study (p = .262 > .05).

The Kruskal-Wallis (KW) test was conducted to find differences in the ICT as hindering technology beliefs of faculty members in regard to field of study (Table 18). The test result was significant (χ^2 (9, N = 203) = 21.332, p = .011< .05). Using Mann-Whitney U was conducted investigating pair differences among the ten fields of study which previously showed significant difference with the Kruskal-Wallis test (Table 17). Faculty members in Teacher Education had beliefs about ICT as hindering technology lower than that of the faculty members in the following four fields: Architecture (U (N = 203) = 105.00, p = .17 < .005), Engineering (U (N = 203) = 362.50, p = .003 < .005), Tourism and Hospitality Management (U (N = 203) = 87.00, p = .002 < .005), and Physical and Natural Sciences (U

Table 17: Descriptive statistics of FBIICT scores by field of study

Field of study	N	Mean±SD	Median (Min-Max)
ICT as assistive technology			
Architecture	12	3.62±0.34	3.6 (3-4)
Business & Economics	19	3.91±0.44	3.9 (3-5)
Communication & Media Studies	21	3.63±0.76	3.7 (1-5)
Computing & Technology	21	3.86±0.43	3.9 (3-5)
Engineering	37	3.60±0.51	3.7 (2-4)
Humanities	11	3.79±0.29	3.8 (3-4)
Physical & Natural Sciences	17	3.56±0.48	3.6 (3-4)
Social & Behavioral Sciences	19	3.56±0.48	3.6 (3-4)
Teacher Education	32	3.76±0.61	3.7 (3-5)
Tourism & Hospitality Management	12	3.64±0.46	3.6 (3-4)
Overall	204	3.69±0.53	3.7 (1-5)
ICT as hindering technology			
Architecture	12	3.00±0.61	3.1 (2-4)
Business & Economics	19	2.59±0.73	2.7 (1-5)
Communication & Media Studies	21	2.56±0.80	2.7 (1-4)
Computing & Technology	21	2.73±0.78	2.5 (2-5)
Engineering	37	2.89±0.57	3.0 (1-4)
Humanities	11	2.59±0.51	2.5 (1-3)
Physical & Natural Sciences	17	3.04±0.55	3.2 (2-4)
Social & Behavioral Sciences	19	2.83±0.83	2.8 (1-5)
Teacher Education	33	2.48±0.60	2.5 (1-4)
Tourism & Hospitality Management	12	3.09±0.44	3.0 (2-4)
Overall	203	2.76±0.68	2.8 (1-5)

($N = 203$) = 138.00, $p = .003 < .005$). Faculty members in Tourism and Hospitality Management believes in ICT as hindering technology more than that of the faculty

members in three other fields, Business and Economics (U (N = 203) = 65.00, p = .024 < .005), Computing and Technology (U (N = 203) = 79.50, p = .042 < .005), and Humanities (U (N = 203) = 33.50, p = .027 < .005). Business and Economics faculty members' belief scores in ICT as hindering technology are lower than that of the faculty members in Engineering (U (N = 203) = 236.00, p = .044 < .005) and Physical and Natural Sciences (U (N = 203) = 84.50, p = .014 < .005). Humanities faculty members had lower scores than Physical and Natural Sciences (U (N = 203) = 46.50, p = .026 < .005).

Table 18: FBIICT ICT as hindering technology factor having significant difference with respect to field of study

Field of study	N	Mean Rank	
Architecture	12	125.83	
Business & Economics	19	84.11	
Communication & Media Studies	21	92.00	
Computing & Technology	21	91.86	
Engineering	37	116.09	
Humanities	11	87.59	
Physical & Natural Sciences	17	130.00	
Social & Behavioral Sciences	19	106.13	
Teacher Education	32	76.80	
Tourism & Hospitality Management	12	132.08	
χ^2			21.332
df			9
p			0.011

Academic Units Aspect

Applied sciences are excluded from the analysis since it was under-represented, having only one participant. Table 19 summarizes the difference in belief scores

Table 19: Descriptive statistics of FBIICT scores depending on academic unit

Academic Unit	N	Mean±SD	Median (Min-Max)
ICT as assistive technology			
Architecture	13	3.64±0.33	3.6 (3-4)
Arts & Sciences	35	3.59±0.44	3.6 (3-4)
Business & Economics	21	3.80±0.50	3.7 (3-5)
Communication & Media Studies	18	3.73±0.48	3.7 (3-5)
Computing & Technology	28	3.87±0.39	3.9 (3-5)
Education	39	3.81±0.58	3.8 (3-5)
Engineering	30	3.53±0.53	3.5 (2-5)
Law	5	3.64±0.74	3.4 (3-4)
Tourism & Hospitality Management	14	3.69±0.45	3.7 (3-4)
Overall	203	3.71±0.49	3.7 (3-5)
ICT as hindering technology			
Architecture	13	2.97±0.59	3.0 (2-4)
Arts & Sciences	35	2.82±0.55	2.8 (1-4)
Business & Economics	21	2.72±0.74	2.8 (1-5)
Communication & Media Studies	18	2.72±0.70	2.9 (1-4)
Computing & Technology	28	2.71±0.75	2.6 (2-5)
Education	39	2.46±0.66	2.5 (1-4)
Engineering	30	2.92±0.58	3.0 (1-4)
Law	5	2.99±1.19	2.8 (2-5)
Tourism & Hospitality Management	14	3.08±0.41	3.1 (2-4)
Overall	203	2.77±0.67	2.8 (1-5)

according to academic units. According to the findings for Factor 1, Computing and Technology (M = 3.87) faculty has the highest and Engineering the lowest (M = 3.53) beliefs about ICT as assistive technology. However, there was no statistically

significant difference between faculty members working in different academic units in their beliefs about using ICT as assitive technology for professional development (p = .136 > .05). For Factor 2, Education faculty has the lowest beliefs (M = 2.46) about the hinderance of ICT use, while faculty from Tourism and Management had the highest belief (M = 3.08).

The Kruskal-Wallis (KW) test was conducted to find differences in the FBIICT scores in regard to academic units resulted in a significant difference between FBIICT Factor 2 beliefs scores in ICT as hindering technology (χ^2 (8, N = 203) = 15.944, p = .043 < .05) as can be seen in Table 20. Mann-Whitney U test results showed some fields of study having significant difference. Since the overall test was significant, pairwise comparisons among the nine groups were completed. A

Table 20: FBIICT ICT as hindering technology factor having significant difference with respect to academic unit

Academic Unit	N	Mean Rank	
Architecture	13	122.27	
Arts & Sciences	35	107.16	
Business & Economics	21	95.57	
Communication & Media Studies	18	102.39	
Computing & Technology	28	92.66	
Education	39	76.91	
Engineering	30	117.43	
Law	5	108.30	
Tourism & Hospitality Management	14	132.68	
χ^2			15.944
df			8
p			0.043

difference was found between the beliefs of Education faculty members and faculty members from other academic units as Architecture U (N = 203) = 140.50, p = .017 < .005; Arts and Sciences U(N = 203) = 460.50, p = .016 < .005; and Engineering U(N = 203) = 342.00, p = .003 < .005. These results show that Education faculty members disagree to the perception of ICT as hindering technology where the others are neutral. Also, beliefs of faculty members of Tourism and Hospitality Management has significant difference from faculty members of Computing and Technology U (N = 203) = 121.00, p = .044 < .005 and of Education U(N = 203) = 116.00, p = .001 < .005.

Teaching Experience Aspect

The last test was performed to find the difference in FBIICT scores between groups of faculty members in regards to their teaching experience. ICT-based belief scores

Table 21: Descriptive statistics of FBIICT scores by teaching experience

Teaching experience	N	Mean±SD	Median (Min-Max)
ICT as assistive technology			
1-7 years	40	3.73±0.49	3.8 (3-5)
8-14 years	56	3.63±0.46	3.6 (2-5)
15-21 years	56	3.73±0.62	3.8 (1-5)
Over 21 years	54	3.70±0.52	3.6 (3-5)
Overall	206	3.70±0.53	3.7 (1-5)
ICT as hindering technology			
1-7 years	40	2.69±0.82	2.6 (1-5)
8-14 years	55	2.77±0.57	2.8 (1-4)
15-21 years	56	2.69±0.74	2.7 (1-5)
Over 21 years	54	2.86±0.58	2.9 (1-5)
Overall	205	2.76±0.67	2.8 (1-5)

were determined according to faculty teaching experience (Table 21). Faculty, with teaching experience from 1 to 7 years and from 15 to 21 years had the highest belief scores (M = 3.73) in ICT as assistive technology for professional development in teaching and learning. For the beliefs related to ICT as hindering technology, the lowest mean was again among faculty who had 1 to 7 years and 15 to 21 years of experience (M = 2.69). On the other hand, faculty who had 8 to 14 years experience believe lowest in assistance (M = 3.63) and senior faculty with over 21 years' experience has highest belief in hinderance (M = 2.86). However, there is no statistically significant difference between beliefs scores and teaching experience since Factor 1 and Factor 2 beliefs are p = .602 > 0.05 and p = .459 > .05, respectively. The results can be summarized as only faculty members' field of study and faculty or school that they work make significant difference in beliefs about ICT as hindering technology.

4.2 Findings of Needs

In this section, the results of the analyses of faculty needs in professional development in teaching and learning and the difference in needs with respect to faculty demographic variables will be reported.

The needs inventory, FNATAL, had a total of 50 items in six categories including six need suggestions by participants. In each of the six categories in FNATAL, space was left for the item 'other'. These six entries were included to allow participants to identify a different need that was not anticipated by the researcher. These were initially item 06, 20, 28, 35, 43, and 50. Since the number of responses for these items was 1, 2, 3, 1, 2, and 2, respectively, they were excluded from the evaluation.

4.2.1 Findings of Needs for Professional Development (FNATAL)

The analyses in this part aim to answer Research Question 3. Faculty needs assessment was completed to investigate specific topics where faculty perceived the need for professional development in teaching and learning. Descriptive statistics of all items are given in Table D1 (see Appendix), where items presented in bold and italics identify the highest and lowest needs in that category, respectively. Table D2 in Appendix displays all items sorted from highest to lowest means. Table 22 summarizes descriptive statistics of the top five items. In this list, the three items with the highest means were: FNATAL43 *'Supporting students with disabilities'* (*M* = 3.16), FNATAL12 '*Developing higher order skills'* (*M* = 3.06), and FNATAL44 '*Teaching students how to learn'* (*M* = 3.04). The others are FNATAL25 '*Preparing effective teaching materials'* (*M* = 2.99) and FNATAL18 '*Developing a course web site'* (*M* = 2.98).

Table 22: Descriptive statistics of highest five needs sorted

Rank	Items		Mean±SD	Median (Min-Max)	Category
1	FNATAL43	Supporting students with disabilities	3.16±1.7	3 (0-5)	Student Support & Guidance
2	FNATAL12	Developing higher order skills in students	3.06±1.7	3 (0-5)	Teaching & Learning Methods
3	FNATAL44	Teaching students how to learn	3.04±1.8	3 (0-5)	Student Support & Guidance
4	FNATAL25	Preparing effective teaching materials	2.99±1.7	3 (0-5)	Teaching Environment
5	FNATAL18	Developing a course Web site	2.98±1.8	3 (0-5)	Instructional Technology

The second highest need, FNATAL12, was the only one from the teaching and learning methods category. Both first and third order items, FNATAL43 and FNATAL44 were in the student support and guidance category. The other two needs; FNATAL25 was from teaching environment category and FNATAL18 was from the instructional technology category.

The least needed topics perceived by faculty, as can be seen in Table 23, were FNATAL35 '*Developing and grading laboratory assignments'* (*M* = 2.04). The

Table 23: Descriptive statistics of lowest six needs sorted

Rank	Item		Mean±SD	Median (Min- Max)	Category
43	FNATAL35	Developing and grading laboratory assignments	2.04±1.8	2 (0-5)	Assessment
42	FNATAL36	Using and evaluating portfolios and e-portfolios	2.25±1.7	2 (0-5)	Assessment
41	FNATAL32	Writing effective essay exams	2.41±1.7	2 (0-5)	Teaching Environment
39	FNATAL40	Teaching and supporting adult learners	2.43±1.5	3 (0-5)	Student Support & Guidance
40	FNATAL33	Writing effective objective tests	2.45±1.7	2 (0-5)	Teaching Environment
38	FNATAL11	Team teaching	2.46±1.6	2 (0-5)	Teaching & Learning Methods

others were FNATAL36 '*Using and evaluating portfolios and e-portfolios'* (*M* = 2.25), FNATAL32 '*Writing effective essay exams'* (*M* = 2.41), and FNATAL33

'*Writing effective objective tests'* (*M* = 2.46). FNATAL40 '*Teaching and supporting adult learners'* (*M* = 2.43) was from the student support and guidance category. There was only one item from the teaching and learning methods category, namely, FNATAL11 '*Team teaching'* (*M* = 2.46). Surprisingly, among the lowest six items, there were two items from both assessment (FNATAL35, FNATAL36) and teaching environment (FNATAL32, FNATAL33) categories.

A closer look at the mean ratings of topics under categories is possible from Table D1 (see Appendix), where the categorized full survey results are displayed with respective mean, standard deviation, minimum and maximum values. The items in the six teaching and learning categories are displayed and differentiated where the highest item is marked in bold and the lowest item in italics.

In Table 24 a summary of Table D1 in Appendix is displayed with the highest and lowest mean items in each category. In the curriculum category, FNATAL05 *'Evaluating the curriculum'* was rated as the greatest need (*M* = 2.91) and FNATAL04 '*Modifying curriculum'* (*M* =2.67) as the lowest. The teaching and learning methods category had the highest, FNATAL12 '*Developing higher order skills in students'* such as critical thinking, problem solving, etc. (*M* = 3.06). Faculty reported less need for FNATAL11 '*Team teaching'* (*M* = 2.46). Within all categories, one of the other highest rated items was in Instructional Technology. Faculty were interested in FNATAL18 '*Developing a course web site'* (*M* = 2.98). Although they were interested in web technologies, one of the recent approaches, FNATAL21 '*Using mobile technology for learning'* was the lowest need (*M* = 2.59). The teaching environment category results showed that FNATAL25 '*Preparing*

Table 24: Descriptive statistics of highest and lowest needs in each of the six categories of FNATAL

Item		Mean±SD*	Median (Min- Max)
	Curriculum		
FNATAL05	Evaluating the curriculum	**2.91±1.6**	3 (0-5)
FNATAL04	Modifying curriculum	*2.67±1.6*	3 (0-5)
	Teaching and Learning Methods		
FNATAL12	Developing higher order skills in students	**3.06±1.7**	3 (0-5)
FNATAL11	Team teaching	*2.46±1.6*	2 (0-5)
	Instructional Technology		
FNATAL18	Developing a course web site	**2.98±1.8**	3 (0-5)
FNATAL21	Using mobile technology for learning	*2.59±1.7*	3 (0-5)
	Teaching Environment		
FNATAL25	Preparing effective teaching materials	**2.99±1.7**	3 (0-5)
FNATAL32	Writing effective essay exams	*2.41±1.7*	2 (0-5)
	Assessment		
FNATAL37	Using research techniques to develop classroom instruction	**2.56±1.6**	3 (0-5)
FNATAL35	Developing and grading laboratory assignments	*2.04±1.8*	2 (0-5)
	Student Support and Guidance		
FNATAL43	Supporting students with disabilities	**3.16±1.7**	3 (0-5)
FNATAL40	Teaching and supporting adult learners	*2.43±1.5*	3 (0-5)

*: Values in bold show highest needs and values in italics show lowest needs in a category.

effective teaching materials' (*M* = 2.99) was needed more than the others items. On the other hand, FNATAL32 '*Writing effective essay exams'* (*M* = 2.41) was very low. As mentioned before, overall assessment category topics were rated very low by the faculty although, within assessment, FNATAL37 '*Using research techniques to develop classroom instruction'* like action research was relatively higher with a mean of 2.56. FNATAL35 '*Developing and grading laboratory assignments'* (*M* = 2.04) was rated very low. Within the student support and guidance category, FNATAL43 '*Supporting students with disabilities'* (*M* = 3.16) was the highest perceived need for development. However, faculty did not feel the importance of adult learning as they

specified FNATAL40 '*Teaching and supporting adult learners'* (*M* =2.43) as the lowest need.

4.2.2 Relationship between Needs for Professional Development (FNATAL) and Demographics

To identify the answers to Research Question 4, the following analysis were performed. The six highest and six lowest needs in six categories were used from Table 24. Then, the differences of needs in regard to demographic variables were explored.

Gender Aspect

First differences between faculty needs among females and males were examined. All the results for the highest and lowest needs can be seen in Table D3 (Appendix). Among these needs, only the least needed, FNATAL35 and FNATAL40 show a significant difference depending on gender (Table 25). FNATAL35 *'Developing and grading laboratory assignments'* is significantly different ($p = .039 < .05$) between females and males. The difference shows that the mean among females ($M = 1.73$) is less than among males ($M = 2.26$). It shows that men perceive the need to develop themselves for preparing and grading assignments in laboratories more than females.

Table 25: Needs having significant difference with respect to gender

	Needs	
	FNATAL35***	FNATAL40***
Gender	Mean±SD* [Median (Min-Max)]	Mean±SD* [Median (Min-Max)]
Female	1.73±1.8 [1 (0-5)]	2.19±1.5 [2 (0-5)]
Male	2.26±1.8 [2 (0-5)]	2.66±1.5 [3 (0-5)]
p	0.039	0.026

*:SD; Standard Deviation; ***:least needed

Another significant difference in gender was FNATAL40, the need for '*Teaching and supporting adult learners'* ($p = .026 < .05$). Here, the mean among females ($M = 2.19$) was less than among males ($M = 2.66$).

Academic Position Aspect

The next question to be answered was whether the needs perceived by faculty varied with regard to academic position. Among all the most and least needed items in all the categories (Table D4 in Appendix), only two needs in the assessment category that show a significant difference are listed in Table 26. These are the most needed FNATAL37 *'Using research techniques to develop classroom instruction'* ($p = .025 < .05$) and the least needed FNATAL35 '*Developing and grading laboratory assignments'* ($p = .020 < .05$). Mann-Whitney U test revealed that the instructors and lecturers ($M = 2.99$) show a significant difference in FNATAL37 with both assistant professors ($M = 2.28$) and associate professors ($M = 2.22$). Similarly, in FNATAL35, there is a significant difference between instructors and lecturers ($M = 2.52$) and both assistant professors ($M = 1.73$) and associate professors ($M = 1.54$).

Table 26: Needs having significant difference with respect to academic position

	Needs	
	FNATAL35***	FNATAL37**
Academic Position	Mean±SD* [Median (Min-Max)]	Mean±SD* [Median (Min-Max)]
Professor	1.96±1.9 [2 (0-5)]	2.33±1.5 [2 (0-5)]
Associate Professor	1.54±1.5 [1 (0-5)]	2.22±1.8 [2 (0-5)]
Assistant Professor	1.73±1.8 [1 (0-5)]	2.28±1.7 [2 (0-5)]
Instructor/Lecturer	2.52±1.9 [3 (0-5)]	2.99±1.6 [3 (0-5)]
p	0.020	0.025

*: SD; Standard Deviation; **:most needed; ***:least needed

Field of Study Aspect

The relationship between needs and fields of study can be seen in Table D5 (see Appendix). Having only one participant resulted Fine and Performing Arts field being excluded from the analysis. One lowest needed item showed significance with regard to field of study (Table 27). This is an item from the assessment category, FNATAL35 *'Developing and grading laboratory assignments'* ($p = .011 < .05$).

FNATAL35 '*Developing and grading laboratory assignments'* is an item which reveals a significant relationship between needs and field of studies. Faculty working in the field of Computing and Technology ($M = 3.19$) shows a difference with faculty in Business and Economics ($M = 1.84$), Humanities ($M = 1.40$), Physical and Natural Sciences ($M = 1.47$), Social and Behavioral Sciences ($M = 1.06$), and Teacher

Table 27: Need having significant difference with respect to field of study

	Need
	FNATAL35***
Field of study	Mean±SD* [Median (Min-Max)]
Architecture	2.18±2.1 [1 (0-5)]
Business & Economics	1.84±1.7 [2 (0-5)]
Communication & Media	2.18±2.0 [1.5 (0-5)]
Computing & Technology	3.19±1.6 [4 (0-5)]
Engineering	2.41±1.7 [2 (0-5)]
Humanities	1.40±1.6 [1 (0-4)]
Physical & Natural Sciences	1.47±1.8 [1 (0-5)]
Social & Behavioral Sciences	1.06±1.7 [0 (0-5)]
Teacher Education	1.55±1.7 [1 (0-5)]
Tourism & Hospitality	2.55±1.9 [3 (0-5)]
p	0.011

*: SD; Standard Deviation; ***:least needed

Education (*M* = 1.55). In addition, faculty from Social and Behavioral Sciences (*M* = 1.06) show a difference with the following fields: Communication and Media Studies (*M* =2.18), Computing and Technology (*M* = 3.19), Engineering (*M* = 2.41), and Tourism and Hospitality Management (*M* = 2.55).

Academic Units Aspect

Next, differences between faculty needs with respect to the academic units they belong to within the institution is investigated and displayed (Table D6 in Appendix). It is found that among the highest and lowest needs in each category; only one in Table 28 shows a significant change depending on academic unit.

Table 28: Needs having significant difference depending on academic unit

	Needs
	FNATAL35***
Academic unit	Mean±SD* [Median (Min-Max)]
Architecture	2.17±2.04 [2 (0-5)]
Arts & Sciences	1.53±1.72 [1 (0-5)]
Business & Economics	1.80±1.85 [2 (0-5)]
Communication & Media	2.05±1.96 [1 (0-5)]
Computing & Technology	2.89±1.79 [4 (0-5)]
Education	1.92±1.82 [2 (0-5)]
Engineering	2.33±1.62 [2 (0-5)]
Law	0.00±0.00 [0 (0-0)]
Tourism & Hospitality	2.23±1.87 [2 (0-5)]
p	0.034

*: SD; Standard Deviation; ***: least needed

FNATAL35 *'Developing and grading laboratory assignments'* shows a difference between various faculties, schools, and departments which is found to be significant ($p = .034 < .05$). The results show that the Law Faculty (*M* = 0.0) shows a significant

difference with all other faculties and schools. There is another significant difference between faculty in the School of Computing and Technology (*M* = 2.89) who need development in grading laboratory assignments more than faculty in Arts and Sciences (*M* = 1.53), Business and Economics (*M* = 1.80), and Teacher Education (*M* = 1.92). Another difference was between Engineering (*M* = 2.33) and Arts and Sciences (*M* = 1.53).

Teaching Experience Aspect

The last part concerns the differences in faculty needs with respect to teaching experience as shown in Table D7 (see Appendix). FNATAL43, the need for '*Supporting students with disabilities'* shows a significant difference ($p = .005 < .01$). The findings (Table 29) show that there is a significant difference between faculty who have over 21 years of teaching experience (*M* = 2.56) and faculty with 8 to 14 years' experience (*M* = 3.38) as well as faculty with 15 to 21 years' experience

Table 29: Needs having significant difference depending on teaching experiences

	Needs
	FNATAL43**
Teaching experience	Mean±SD* [Median (Min-Max)]
1-7 years	3.05±1.7 [3 (0-5)]
8-14 years	3.38±1.5 [4 (0-5)]
15-21 years	3.64±1.7 [4 (0-5)]
Over 21 years	2.56±1.8 [3 (0-5)]
p	0.005

*SD; Standard Deviation; **:most needed; ***:least needed

(M = 3.64). Faculty with 15 to 21 years' experience (M = 3.64) shows a significant difference from faculty with 1 to 7 years' experience (M = 3.05).

4.3 Correlations between Beliefs and Needs

The relationship between faculty members' beliefs and professional development needs is investigated in three parts. The first part attempts to find the relationship between faculty beliefs about professional development in teaching and learning and their needs for professional development in teaching and learning. The second part aims to explore the relationship between faculty beliefs about ICT-based professional development in teaching and learning and their needs for professional development in teaching and learning. The third part investigates the relationship between faculty beliefs about professional development in teaching and learning and their beliefs in ICT-based professional development in teaching and learning. While the first two parts seek the answers to Research Question 5, the third one explores Research Question 8.

4.3.1 Beliefs about Professional Development (FBITAL) vs Needs for Professional Development (FNATAL)

The correlation between FBITAL scores in both Factor 1 and Factor 2 and all of the needs items in each category was analyzed. The results show that all of the 43 needs are positively correlated to the beliefs in Factor 1. Both the high and low needed items in all categories that are positively correlated to the enthusiastic belief scores about professional development in teaching and learning were listed in Table E1 (see Appendix). The FBITAL Factor 1 scores and needs were all correlated at .01 significance and 2-tailed level. The correlation coefficients and their significance levels for FNATAL04, FNATAL05, FNATAL11, FNATAL12, FNATAL18, FNATAL21, FNATAL25, FNATAL32, FNATAL35, FNATAL37, FNATAL40, and

FNATAL43 can be seen in Appendix Table E1. This means that beliefs about professional development are significantly positively correlated to highest and lowest faculty needs for development in modifying and evaluating the curriculum, team teaching, building up higher order skills in students, developing a course web site, using mobile technology for instructional purposes, preparing effective teaching materials, writing effective essay exams, enhancing skills in laboratory assignments, action research, and supporting adult and disabled students.

The correlation results showed that FBITAL Factor 2 beliefs scores and all of the 43 needs are negatively correlated. Table E2 in Appendix lists the high and low needed items in all categories negatively correlated to the apathetic belief scores about professional development in teaching and learning. Within the needs four needs were significantly correlated. The FBITAL scores and FNATAL12, FNATAL18, and FNATAL43 were all correlated at 0.05 significance and 2-tailed level. Only FNATAL21 was correlated at 0.01 significance and 2-tailed level. These can be interpreted as, those faculty members who have more apathetic beliefs in professional development in teaching and learning perceive less needs for developing higher order skills in students, developing a course web site, using mobile technology for learning, and supporting students with disabilities. This can be pinpointed as faculty members being eager to develop for 21st century skills.

In summary, all high and low needed items in all categories were significantly positively correlated to the enthusiastic belief scores about professional development in teaching and learning. Along these lines, all items were negatively correlated to

apathetic beliefs where only four are significant (mobile technology, higher order skills, developing web site, supporting disabled students).

These relationships may clarify that the beliefs of faculty form the basis for their needs. If they did not believe in professional development, they may not perceive and express these needs. These survey results were used for the purpose of planning professional development activities.

4.3.2 Beliefs about ICT-based Professional Development (FBIICT) vs Needs about Professional Development (FNATAL)

In the second part, beliefs about ICT-based professional development FBIICT are correlated with the needs. All of the minimum and maximum needed items were positively correlated. Ten out of 12 needs items were significantly positively correlated with FBIICT Factor 1 scores. FBIICT Factor 2 scores were negatively correlated with high and low needs except the two items in curriculum category which were positively correlated. Only three items were significantly negatively correlated with FBIICT Factor 2 scores. The correlation found between FBIICT scores and FNATAL high and low needed items are displayed in Table E3 and Table E4 in Appendix.

Belief scores for ICT as assistive technology and FNATAL05, FNATAL11, FNATAL12, FNATAL18, FNATAL21, FNATAL32, FNATAL35, FNATAL37, and FNATAL43 were correlated at 0.01 or 0.05 statistically significant and 2-tailed levels. The respective correlation coefficients and significance levels can be seen in Table E3 (Appendix). According to these results, faculty beliefs about using ICT as assistive technology for professional development are correlated with developmental needs in evaluating the curriculum, team teaching, building up higher order skills in

students, developing course a web site, using mobile technology for instructional purposes, preparing effective teaching materials, writing effective essay exams, enhancing skills in laboratory assignments, action research, and supporting disabled students. This consists of nine of the twelve high and low needs.

Also faculty who considers ICT as a hinderance and FNATAL21, FNATAL40 and FNATAL43 were negatively correlated at .01 and .05 statistically significant and 2-tailed levels. The respective correlation coefficients and significance levels are displayed in Table E4 (see Appendix). The beliefs about hinderance to use ICT were negatively correlated to using mobile technology for learning, supporting adult learners and disabled students. This clarify that faculty members who believe more in ICT as hindering technology perceive less need in developing themselves to use mobile technology for learning, and supporting adult and disabled students from student support and guidance category.

In summary, all high and low needed items were positively correlated with ICT as assistive technology scores, ten out of 12 needs items were significantly correlated (mobile technology, higher order skills, developing web site, supporting disabled students, developing teaching materials, essay exams, lab assignments, action research, evaluating curriculum, team teaching). ICT as hindering technology scores were negatively correlated except two items in curriculum category. Three items were significantly correlated (mobile technology, supporting disabled students and adult learners).

4.3.3 Beliefs about Professional Development (FBITAL) vs Beliefs about ICT-based Professional Development (FBIICT)

Until this part, the research questions related to beliefs about professional development and beliefs about ICT-based professional development have been investigated. This last section explores whether these two beliefs have a relationship to respond to Research Question 8. The correlation coefficients and significance levels are shown in Table 30.

The relationship between faculty members' enthusiastic beliefs (Factor 1) about professional development and apathetic beliefs (Factor 2) about professional development has correlation. The correlation between FBITAL Factor 1 and FBITAL Factor 2 is statistically significant ($p < .000$) at significance level .01 with a negative correlation. This is a natural and expected result since those faculty members who has enthusiastic beliefs look at professional development as a positive asset, where the apathetic believing faculty members see more negative aspects.

Table 30: Correlations among FBITAL and FBIICT

	FBITAL Factor 1	FBITAL Factor 2	FBIICT Factor 1	FBIICT Factor 2
FBITAL Factor 1	1.00			
FBITAL Factor 2	-.413**	1.00		
FBIICT Factor 1	.557**	-.299**	1.00	
FBIICT Factor 2	-.296**	.431**	-.431**	1.00

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

The relationship between faculty members' beliefs about professional development and beliefs about ICT-based professional development clarifies that the correlation between FBITAL Factor 1 and FBIICT is statistically significant for both Factor 1 and Factor 2 ($p < .000$) at significance level .01 with a positive correlation and

negative correlation, respectively. As a result, faculty members having strong enthusiastic beliefs about professional development demonstrate strong beliefs about ICT-based professional development in terms of using ICT as assistance. On the other hand having strong enthusiastic beliefs about professional development may disagree with the beliefs about hinderance of ICT for ICT-based professional development.

Faculty members' apathetic beliefs about professional development relation to beliefs about ICT-based professional development explain that there is correlation between FBITAL Factor 2 and FBIICT which is statistically significant for both Factor 1 and Factor 2 ($p < .000$) at significance level .01 with a negative correlation and positive correlation, respectively. This identifies that faculty members having strongly agreeing on apathetic beliefs about professional development demonstrate weak beliefs about ICT-based professional development in terms of using ICT as assistance, whereas they display stronger beliefs about hinderance of using ICT for professional development.

The correlation between faculty members' ICT as assistance and ICT as hinderance beliefs about ICT-based professional has correlation. The correlation between FBIICT Factor 1 and FBIICT Factor 2 is statistically significant ($p < .000$) at significance level .01 with a negative correlation. As a predictable result, faculty members who believe more in ICT as assistance technology believe less in ICT as hinderance technology for professional development in teaching and learning. On the other hand having strong enthusiastic beliefs about professional development may

disagree with the beliefs about hinderance of ICT for ICT-based professional development.

Chapter 5

DISCUSSIONS AND CONCLUSIONS

This chapter will finalize the inferences drawn from research findings on faculty beliefs and needs and related discussions in the literature. These deductions are done on the basis of faculty beliefs and needs related to professional development in teaching and learning. In the first part, the findings will be summarized and discussed. In the second part, the implications related to policy and practice, future study and limitations will be followed by concluding remarks.

5.1 Summary of Findings and Discussions

Professional development, especially in the area of teaching and learning, is globally gaining importance in higher education. Faculty have long been involved in and favor professional development programs (Centra, 1976), nowadays moving towards unified efforts (Sorcinelli et al., 2006) to eliminate borders in education. In addition to individual efforts, there are innumerable institutional, national, and international efforts in this area. Even though there are still universities which totally lack or have only limited formal opportunities. Determining faculty beliefs and needs which are emphasized by adult learning theories can trigger changes for development. This study investigates whether EMU faculty believes in professional development in teaching and learning and in using ICT for this purpose, as well as their needs.

The literature was reviewed to explore the goals, research methodologies, and results of related studies on faculty beliefs and needs for the purpose of professional

development in teaching and learning. A quantitative research study was designed and a survey including two belief inventories and a needs assessment instrument were developed. Expert reviews for survey validity and a pilot study were done. The reliability of the beliefs inventories were assured by collecting additional data from four other universities in North Cyprus. As a result, these inventory scales satisfied the statistical requirements and were deemed to be sufficiently reliable for assessing faculty beliefs about professional development in teaching and learning and ICT-based professional development in teaching and learning. Finally, the beliefs inventories and the needs topics data collected from EMU faculty's responses were analyzed and the findings are summarized.

5.1.1 Faculty Beliefs about Professional Development in Teaching and Learning (FBITAL)

Beliefs are considered as a very important factor for teaching and learning, faculty development, and using technology. Beliefs are vital for all three stages of professional development: before professional development, during professional development, and after professional development. Since beliefs can structure behavior (Bandura, 1986) and hinder people's awareness of the need for professional development (Holton, 2002; Wenger & Syder, 2000), that can cause unwillingness to attend such activities. Even if faculty are conscious to develop, these beliefs can create barriers to their learning during professional development. Raths (2001)'s literature review stated that the prior beliefs of teacher candidates can hinder their learning about teaching. Also after professional development, holding certain beliefs can be an obstacle for practicing (Kane et al., 2002) what they have learned.

The survey reliability of the beliefs inventory developed for this research is extracted to two factor structure. They formed ‘Enthusiastic beliefs’ and ‘Apathetic beliefs’. The results of this study clarified that most of the faculty in EMU enthusiasticly believes in professional development at a higher level of agreement. Faculty claimed that they disagree with the apathetic beliefs. This is an encouraging status since, as Cafferalla and Zinn (1999) revealed, strong personal beliefs and values about continuous professional development are significant facilitators for professional development, although still in some cases, beliefs about professional development in academic disciplines are stronger than beliefs about professional development in teaching (Sorcinelli et al., 2006).

Differences in both enthusiastic and apathetic beliefs about professional development in respect to demographics show that neither gender, academic position, field of study, academic unit, nor teaching experience display a significant difference. Parallel to these findings, Kalivoda et al. (1993) found that assistant, associate, and full professors share many beliefs related to academic careers whereas associate professors (13.7%) exhibit less than assistant professors (37.5%) and professors (21.4%) in terms of identifying development as an effective teacher as one of their goals. Here beliefs can be considered to be the basis for setting goals.

When considering teaching experience, Kalivoda et al. (1993) revealed that new and young faculty perceives more developmental need in teaching and learning. Another study, conducted by Norton et al. (2010), discovered that new faculty believes more in professional development. Contrary to these findings, Sydow (1993) and Brawner et al. (2001) commented that mid-carreer faculty is more involved in professional

development programs. This range of participants may confirm the findings of other studies claiming that there are more development programs targeting mid-career faculty (Richlin & Essington, 2004; Romano et al., 2004). Ferman (2002) interviewed the participants to investigate whether they see professional development as a 'choice' or 'necessity'. Here, contrary to the others, moderately experienced faculty perceived professional development activities as a choice. The lowest beliefs about professional development were among faculty whom their experience was from 8-14 years. In the case of this study there was no significant difference in beliefs with respect to teaching experience.

5.1.2 Faculty Beliefs about ICT-based Professional Development in Teaching and Learning (FBIICT)

Faculty beliefs and ICT use have been investigated for a long time (Foley & Ojeda, 2007; Lumpe & Chambers, 2001; Teo et al., 2008; Veen, 1993) and their effects on individual and professional use have been identified. Although using ICT as a tool for student' learning is generally discussed, its use for faculty learning is not so often argued.

As a result of the ICT-based beliefs inventory reliability, two factor structures were formed. They are distinguished as beliefs about 'ICT as assistive technology' and 'ICT as hindering technology'. In the EMU survey, faculty beliefs about ICT-based development were rated lower than beliefs about professional development. This result can predict that in addition to having a very good technological infrastructure in EMU, faculty seems not to connect technology to pedagogy adequately. This may be because they may not have potential knowledge of educational technology or technology-enhanced learning and how it can be used to facilitate learning. Another

issue may be that not all of the ICT-based technological tools mentioned in the survey could be familiar to the faculty members. Since Mahdizadeh et al. (2008) found that teachers believe that the following factors add value for teaching and learning processes: presentation of course materials and information about the courses, slide presentations, and e-mail. Satisfyingly, faculty overall strongly believe in assistive use of ICT for faculty development. Whereas beliefs about hindering use of ICT is close to neutral. The two belief factors, assistance and hinderance, can cause faculty to cognitively foster ICT enablers and barriers in using and practicing ICT for professional development in teaching and learning. Although being neutral about beliefs in ICT hinderance may expose a need to clarify the positive role of using ICT for professional development.

Hence, the belief results display a rising interest among faculty for using technology for professional development purposes. Previously mentioned literature review findings show that beliefs influence the use and practice of technology by faculty. The literature also indicates that beliefs can be enablers or barriers to ICT use. The two factors, of this inventory, assistance and hinderance, also support similar beliefs among faculty members about ICT-based professional development in teaching and learning. Ertmer, Ottenbreit-Leftwich, and York (2006-2007) interpret teachers' beliefs about and perception of technology integration as intrinsic barriers to outstanding technology use, "whereas personal beliefs, previous success with technology, and self-efficacy might be viewed as being intrinsic enablers" (p. 1). In their study, personal beliefs were rated as one of the highest enablers (M = 4.84) that influence success in technology use, which is supported by an extrinsic factor, professional development (M = 4.44). In addition, Steel (2009) comments that "…,

internal barriers such as teacher beliefs about web technologies are more complicated, demanding, and remain a challenging area for academic development." (p. 401). Steel investigated the establishment of pedagogical beliefs and beliefs about the use of web technologies in teaching and learning environments. Concluding with teachers' admission that they believed technology has to be used to respond to educational needs, not only for the sake of using technology. Another research finds 43% variance in teachers' beliefs and use of e-learning environments, concluding that beliefs about e-learning affect the value given to as well as the use of these environments (Mahdizadeh, Biemans, & Mulder, 2008).

Latter studies consider the importance and influence of faculty beliefs in the classroom or online use of technology. Others emphasize that faculty beliefs may affect not only their teaching but also their learning. For this reason, Ertmer (2005) and Ertmer et al. (2006-2007) mention important implications for professional development. A study conducted on teachers showed that those who have stronger beliefs about the positive influence of web-based learning use web-based professional development opportunities more frequently (Kao & Tsai, 2009). An interesting finding was from Ferman (2002) where using technology was selected as a minor theme for individual professional development. Chesney and Benson (2012) commented that faculty used PLS for continuous development system more for individual development activities where professional practices would be more enhanced if the colleagues were actively engaged.

Beliefs in assistance of ICT use show no significant difference in regard to any of the faculty demographics. Neither do beliefs about ICT as hinderance has significant

difference except in respect to field of study and academic unit. It is clear that all faculty regardless of who they are, believe in assistance of ICT for professional development. But those who believe hinderance of ICT for professional development differ according to their disciplines and the academic units they work. This can be well understood, since some disciplines are more into technology and are familiar with both aspects of technology use, assistance and hinderance. On the other hand, in some disciplines pedagogical use of ICT may not be stressed that much.

Although there was no statistical significance, an analysis of the beliefs about the use of ICT according to academic position and teaching experience showed that there is supporting evidence in both factors. Instructors and lecturers reported higher levels of belief than other academics in assistive and lower level of beliefs in hindering use of ICT for their professional development. Similarly, in terms of teaching experience, both faculty with 1 to 7 and 15 to 21 years of experience showed higher in assistive belief and lower in hindering than others. This may mean that those, like junior and mid-experienced faculty, know and use technology more than others and are conscious about both the positive and negative traits of ICT use. The same can be said for instructors and lecturers who are using technology in more practical aspects. Teo et al. (2008) found that there was an inverse relationship between age and beliefs in technology use. Although it is questionable whether academic ranks closely match the age of the faculty.

Considering the field of studies, the relatively lower apathetic belief scores of Teacher Education faculty members may indicate that they do not see technology as a barrier for professional development. The faculty members in this discipline are

from a variety of sub disciplines such as technology education, language education and music education where education is the common focus. So the difference may rise because Teacher Education is a composite discipline where the others are more homogenous. Another possible explanation may be that the faculty members who are neutral in believing ICT as hindering technology may not know educational use of technology well enough. Some faculty disagree the hinderance as in the field of Teacher Education. Teacher educators may look at development from a more pedagogical perspective where the use of technology for educational purposes has recently been flourishing. Also the teachers are familiar with pedagogical uses of technology. Engineers and scientists follow up on technological innovations and are likely to believe in positive aspects of using innovative technology. Although, they claimed neutral in believing hinderance of ICT which is an anticipated result since they may not be familiar with pedagogical use of ICT as much as teacher educators. On the other hand the faculty members from Tourism and Hospitality Management neither disagree nor agree in believing technology as a barrier. The faculty members of Tourism and Hospitality Management and Physical and Natural Sciences may not be using ICT technology often enough to recognize its limitations than Business, Computer and Technology, and Humanities.

Results in respect to academic unit verify previously obtained similar results with respect to faculty members' field of study. Education faculty embraces various disciplines from technical to social sciences teacher education so the differences may exist. Tourism faculty members neither disagree nor agree for the hinderance of ICT compared to members of the two other faculties which are more disagreeing. The strongest beliefs in academic units can be considered as normal since engineering

and computer-related units require faculty members to update themselves because of the nature of their disciplines where many innovations and changes take place at great speed. They may not be familiar how to integrate technology into pedagogy. Besides teacher education is an academic discipline which embraces continuous teaching and learning using technology.

5.1.3 Faculty Needs for Professional Development in Teaching and Learning (FNATAL)

Needs of faculty are typically identified by their higher education institution or consortium of institutions, in national and international arenas. Needs results have been gathered from different types of schools in different parts of the world (Eleser & Chauvin, 1998; Kisner et al., 1998; Krause, 2012; Matsubayaski et al., 2009; Saena, 2003; Wallin and Smith, 2005). Among these, faculty needs for professional development such as perceived need for content competencies and the preference for a particular way of development are examined. This research only considers competency topics.

The needs assessment results showed that faculty mainly needs to develop more in certain competence development topics. This may be because they believe they are weak and expect to improve themselves on these subjects. Despite lack of knowledge, it may be so that they are aware of the importance of improving themselves in those areas. Competence development topics in this research are grouped under six categories: curriculum, teaching and learning methods, instructional technology, teaching environment, assessment, and student support and guidance. Within categories the most needed were student support and guidance and curriculum. The most needed items with highest the means in each of the six

categories were evaluating the curriculum, developing higher order skills, developing a course web site, preparing effective teaching materials, using action research, and supporting students with disabilities. Supporting students with disabilities was the most needed competence development topic. In addition, under the same category of student support and guidance, teaching students how to learn was rated very high. One item from teaching and learning methods and one from instructional technology were top rated. These were developing higher order skills, and developing a web site, respectively. Preparing effective teaching materials was also a highly selected item in teaching environment category.

Developing higher order skills in students was highly rated by EMU faculty. This is similar to the findings of many other research studies since they also discovered that faculty are generally in need of learning how to develop students' higher order skills such as critical thinking, problem solving, etc. (Diaz et al., 2010; D'Cruz-Endeley, 1994; Matsubayaski, Drake, Shaw, & DeZure, 2009; Saena, 2003; Wallin & Smith, 2005). One of the reasons for this may be that starting from the 21st century there is more emphasis on higher order skills for students' learning outcomes and curriculum updates for global expectations for quality higher education. Most of the educational faculty (83.3%) stated that they want to learn in order to facilitate students to solve problems and think critically (Johnson et al., 1998). Especially in Wallin and Smith, faculty reported the need to improve themselves in utilizing instructional methods to develop higher order skills in students as much as possible. Similarly, in Saena, 73% of faculty acknowledged that student critical thinking skills were needed. Diaz et al. also discovered that development in inquiry learning and critical thinking skills was needed to overcome the challenges of the European Higher Education Area (EHEA).

The third highest rated need item was similarly emphasized in the findings of Matsubayaski et al. (2009) where they discovered that teaching students how to learn (42.3%) was one of the highest needs of faculty. The perceptions of educational developers in Standford (2002) were also such that the highest need of faculty was identifying the learning characteristics of the students who are the target for the development of instruction (M = 4.26). They also reported the need for pedagogical skills such as using different teaching methods to accommodate different learning styles (M = 4.13) as important.

The instructional technology category was one of the most needed. Although faculty was interested in developing and publishing a web site for their courses, the usage of online courses was disregarded and rated low. Within this category, mobile learning, although rated lowest, was one of the items significantly correlated with apathetic, ICT as assistive and hinderance beliefs. Odabaşı (2003) also revealed that faculty needed to learn ways to use technology in teaching and learning (61.7%), which is similar to the findings of Vajoczki and Knorr (2010). One of the popular topics in Faculty Learning Communities was technology topics (Richlin & Essington, 2004), which EMU faculty also reported the need to develop. The highest need related to the development in web usage were not consistent with Standford (2002) where educational officers claimed that teaching skills in the media category indicate that participation in web-based instruction (M = 4.52) and participation in distance learning (M = 4.20) are moderately needed. Recently, the extension of using technology from the classroom to web-based environments is popular among faculty and supported by EMU. This may be the reason faculty claimed a high need for using the web. The highest needs in the instructional technology category in EMU

may show that in spite of living in a developing country that is technologically equipped, faculty still feels the need to develop themselves in how to use and benefit from these innovative technologies for teaching and learning.

Among teaching environment category motivating students effectively was rated as one of the desired. Despite the fact that it was not rated high overall, to increase student motivation has become the focal interest for many years. There are findings related to the effect of motivation on teaching and learning in many studies (Diaz et al., 2010; Eleser & Chauvin, 1998; Saena, 2003; Vajoczki & Knorr, 2010). Teachers should be concerned about students' motivation even from earlier ages, since negative statements can effect students' belief in themselves (Yaratan & Yücesoylu, 2010). Parallel to the one of the most needed items from teaching environment, preparing effective current instructional materials was one of the most needed items in Wallin and Smith (2005).

In our study, although higher order skill development was rated as one of the highest items, the category of development in teaching and learning methods was moderate. As well, in various research studies, faculty mainly perceived the need for professional development to improve their teaching skills and develop in teaching and learning methods and strategies (Diaz et al., 2010; Kisner et al., 1998; Moeini, 2003; Selman, 1986; Standford, 2002). Camblin and Steger (2000) also discovered that faculty benefits from activities designed to develop pedagogical skills and teaching features. Other studies indicate that new faculty wants to improve themselves in using the latest education approaches and teaching skills (Kalivoda et al., 1994; Norton et al., 2010).

A most needed item in assessment category was action research where faculty reported need to develop themselves in using research techniques to improve teaching in the classroom. A similar result was found by Johnson et al. (1998) where faculty also stated the need to develop their skills in action research specifically on performance-based assessment.

In each category less perceived needs were: modifying the curriculum, team teaching, using mobile technology for learning, writing effective essay exams, developing and grading laboratory assignments, and teaching and supporting adult learners. The assessment of students was perceived as the least needed category. The highly rated item in this category had mean which was close to the least needed items in other categories. This was related to improving assessment during laboratory instruction. Faculty did not express the need in developing themselves for assessing their students within the classroom. Moeini's (2003) research also showed that faculty did not perceive the need to develop in measurement and evaluation. It is remarkable to see similar research results from Turkey, where the educational system is not very different than the one in North Cyprus. Similar to the results obtained by Johnson et al. (1998), faculty perceived a lower level of need in understanding different types of assessment compared to middle school teachers. Also considering development for online teaching, Taylor and McQuiggan (2008) found that faculty members express less of a need for creating effective assessment instruments (35.3%) and finding out different ways to assess student progress (33.8%).

Further analyzing the difference of needs depending on demographic data, an interesting finding concerned laboratory assessment. Although developing and

grading laboratory assignments was a less needed item, it showed a significant difference in terms of most of the demographic variables (gender, academic position, field of study, and academic units) but not teaching experience. Faculty who needs to develop in laboratory assessment shows differences according to gender (men perceive the need more than women), academic position (instructors perceive the need more than assistant and associate professors), field of study (Computing and Technology and Engineering faculty perceive a greater need than some others), and academic unit (members of the Law Faculty perceive less of a need less than all others, Computing and Technology and Engineering less than some others). The significant difference in laboratory grading shows that men perceive the need to develop themselves for preparing and grading assignments in laboratories more than women. Laboratories are mainly used in engineering and computing and technology where the population of male faculty responsible for laboratories can be high. The response may also show that, since assistants usually do the preparation and grading, male faculty seem not to feel that they have adequate skills and need to develop. The latter result also identifies that, compared to both assistant professors and associate professors; instructors and lecturers need more to expand their knowledge about developing and grading laboratory assignments. The findings show a difference between instructors and lecturers and other academic ranks. The reason can be such as mentioned previously, that laboratories are used more in the fields of engineering and computing and technology, the latter having more non-academic faculty. This may be since instructors and lecturers, different from academic faculty, have a greater desire and perceive a greater need for developing themselves in teaching in the classroom and laboratories. The differences in field of study and academic unit were also obvious since some departments have no compulsory laboratory work and

laboratory usage is mainly functional in engineering and computer-related disciplines. From another perspective, this difference of needs may demonstrate that either laboratories are frequently used and faculty needs to get better in assessment or that they do not use them at all and therefore do not perceive any need. The results for developing and grading laboratory assignments show that faculty in the field Computing and Technology perceive the need to improve themselves in laboratory assignment development and grading more than faculty in Business and Economics, Humanities, and Physical and Natural Sciences. This result is understandable since faculty doing technology-related teaching frequently uses laboratories. Engineers, as users of laboratories, also perceive the need to develop themselves in laboratory grading more than in the other three fields: Physical and Natural sciences, Social and Behavioral Sciences, and Teacher Education. The last result shows that faculty in Social and Behavioral Sciences needs to develop themselves in laboratory assignments less than faculty in Engineering and Tourism and Hospitality Management but more than in Communication and Media Studies. A similar result was obtained from needs in relation to academic units. Since members of the Law Faculty do not use laboratories and naturally claimed that they did not need to develop themselves in laboratory assignments. On the other hand, faculty in Engineering and the School of Computing and Technology, where laboratories are used regularly, needs development in assignment more than in the other academic units mentioned earlier. Both need development in this area more than the Faculty of Arts and Sciences while the School of Computing and Technology needs it more than in the faculties of Business and Economics and Education.

Among the highest perceived needs, two items, namely, doing action research and supporting students with disabilities showed a significant difference with respect to some demographic data. Two other items among the least perceived needs were laboratory assessment and supporting adult learners showing a significant difference in respect to some demographic data. These results show that male faculty members feel a greater need to develop themselves in adult learning issues than their female colleagues. The reason for female faculty perceiving less of a need in both cases may be that they have intrinsically concerned with adult learners through their caring role as mothers. The results show that instructors and lecturers perceived a greater need to learn action research compared to both assistant professors and associate professors. Since the former are not academicians, they may be more distant to action research and therefore perceive the need to develop their teaching in the classroom in this way. An analysis of the difference of the need in supporting students with disabilities with regard to teaching experience showed that faculty with over 21 years of teaching experience perceived less of a need to learn than mid-experienced faculty with 8 to 21 years. Similarly, junior faculty reported less of a need to learn than those with 15 to 21 years of experience. Faculty with the most teaching experience do not perceive the need to learn how to support disabled students compared to faculty with from 8 to 21 years' experience. This result shows that mid-experienced faculty members need to develop themselves about students with disabilities compared to new faculty members. This may be because junior faculty members do not display adequate interest about student disabilities, while senior faculty may feel sufficient to handle those students' needs. The more experienced faculty may feel less of a need to develop to offer support to disabled students since they may have already developed the necessary skills over the years.

Diversity among academic ranks is also seen in Kalivoda et al. (1994) where only assistant professors (14.3%) stated a wish to develop in teaching skills, contrary to EMU, where, although it was among the top needs, faculty did not demonstrate any significant difference. Besides the differences in academic rank in Kalivoda et al. (1993), another research by D'Cruz-Endeley (1994) found significant differences based on gender, academic rank, and teaching discipline. Contrary to these, some studies found no significant difference between ranks and preferences in professional development activities (Taylor & McQuiggan, 2008).

5.1.4 Relationship between Beliefs and Needs

The analysis revealed that faculty beliefs about professional development influence all of the highest and lowest needs in all categories. The enthusiastic beliefs are positively and apathetic beliefs are negatively correlated to these needs. In addition, faculty beliefs about the assistance and hinderance of ICT use for professional development in teaching and learning were related to ten and three needs items, respectively. One category, teaching environment, had both the highest and lowest needs not correlated with ICT as assistive technology. Using mobile technology, supporting adult learners and supporting students with disabilities were correlated with hinderance to use ICT. Two needs, using mobile technology for learning and supporting students with disabilities, were correlated with faculty beliefs both in assistance and hinderance in ICT use.

Those faculty who have strong beliefs about developing themselves perceive similar powerful need to develop themselves by means of using ICT or not. Recall that there is a correlation between faculty members' beliefs about professional development

and beliefs about both the assistance and hinderance of ICT-based professional development. EMU faculty who believe in development are not interfered with the means to the end, in our case the use of technology as a tool, and they perceive similar needs in either case. The results verified that members of faculty who are interested in professional development are also interested in ICT-based professional development in teaching and learning. Faculty members' all highest and lowest needs are correlated to beliefs; most of them are correlated to ICT as assistive technology beliefs, but few of them are correlated to ICT as hindering technology beliefs. These outcomes enlighten the fact that the faculty who are believers in professional development may also be believers of assistance of ICT for professional development.

It was important and understandable that only needs for modifying curriculum and supporting adult learners were not correlated with ICT as assistive technology beliefs. The relationship between beliefs about ICT as hindering technology and the need to develop in mobile technology was very meaningful since those faculty members do not believe in innovative technology such as m-learning.

It can be briefly explained as, those faculty members who have more apathetic beliefs perceive less needs for developing for 21st century skills such as mobile technology, higher order skills, develop web site besides supporting disabled students. Faculty who believe in ICT as assistive technology can perceive more need to develop in these skills. On the other side, faculty who believe ICT as hinderance can perceive less need in mobile technology and supporting disabled students. Those who have enthusiastic beliefs related to professional development have also positive

beliefs as assistive technology beliefs about ICT-based development. Similarly those who have negative beliefs in professional development have negative beliefs (apathetic vs ICT as hindering technology). Those who have higher positive beliefs (enthusiastic, ICT assistive technology) have lower negative beliefs (apathetic, ICT hindering technology).

5.2 Implications

The results of this study identified that faculty believe in professional development in teaching and learning and in using ICT for its purpose. The significance of this research can cover many aspects. In addition to the expectation to contribute to international literature on beliefs about professional development and about ICT-based professional development in teaching and learning, it may reveal the needs of faculty in the 21st century. There are also significant implications on the policy and practice of higher education institutions and governmental organizations related to higher education. It can guide the initiation, planning, and designing of ICT-based professional development in developing countries.

5.2.1 Implications to Policy and Practice

This research has taken place in an international university located in an educational island with seven higher education institutions. The rate and magnitude of change and development brings up the fact that North Cyprus is in need of well trained, qualified, and skilled manpower that are also expected to be engaged in scientific research (Çağlar & Reis, 2007). Faculty members in higher education constitute a remarkable part of this manpower that need inservice training. Recently, some suggestions for faculty training programs (Ünver, 2010) came up where faculty members should be ready for their changing roles (Kızıltepe, 2010). Institutions in

countries in this situation tend to follow footsteps of developed ones with established faculty development models. As Chism, Gosling, and Sorcinelli (2010) assert, nowadays increased communication and collaboration among faculty developers help them make connections between institutions and practices forming the future of higher education.

No similar research has been done to identify the developmental needs and beliefs of these people in specifically Eastern Mediterranean University, nor generally where it is situated, in North Cyprus. An investigation of past and current professional development initiatives also clarified that there is not much printed record of what has been done in a historical perspective. The findings on faculty beliefs about professional development in teaching and learning revealed that EMU faculty firmly believes in professional development. EMU faculty has also showed that they believe in professional development through the use of technology. It is therefore expected that exploring faculty beliefs and identifying their needs will be opening a gate to the creation of professional development opportunities using innovative computer and communication technologies. The outcomes of this study can be used to design an ICT-based Faculty Professional Development Model for EMU which will help faculty to self-develop and be aware of global trends, maintain and extend quality in teaching and learning. Although an important point considered should be that this model should take place in such technology enhanced professional development environment, where technology use is the means to the end. It should be kept in mind that there are some ICT-based professional development models designed from a traditional point of view where ICT is used only as a tool and pedagogical use of technology is misjudged. A very important comment from Guskey (2000) is that

large-group of professional development activities that help sharing information and developing knowledge base are insufficient. He proposes that "to lead to changes in practice and improved results with students, however, they must be accompanied by structured opportunities for practice with feedback, collaborative planning, and ongoing assistance." (p. 209) As Attwell (2007) says there is a need 'to look at new opportunities for learning afforted by emerging technologies', thus questioning the possibility of Personal Learning Environments being the future of e-learning. Chesney and Benson (2012) investigated the use of a Personal Learning System with blog, presentation, and e-portfolio tools; that was found by the participants useful to reflect on their work. In addition, Kaya and Altun (2011) proposes an ontology based learner model for e-learning systems which use instructional learning objects by analyzing learners' individual attributes, gains, performances, and demographics to create a personalized learning experience. The universities administrators should take these proposals into account when planning professional development activities.

Literature suggested that faculty needs and interests, areas of expertise, basic skills, and prior knowledge should be investigated in order to tailor the programs depending on the desired outcomes and to involve more faculty (Brew & Baud, 1996; Centra, 1976; Wilde, 1996). In a follow-up study by Sydow (1998), faculty stated that they were satisfied with professional development programs and that teaching and learning had improved. Similar research findings by Brawner et al. (2001) mention that attendance in more professional development activities bring the participants a different perspective and more non-traditional teaching and learning methods believing that 'the changes led to improvements in their teaching'. According to the results of this study some activities can be organized to create

"Awareness/Readiness" to change faculty beliefs in specific disciplines or in academic units, especially for ICT-based professional development. Hence, it will be anticipated that faculty who believe both in professional development and ICT-based professional development will be willing to attend faculty development programs. Especially the members of faculties of Engineering, Architecture, Tourism and Hospitality, and Law were neutral in their ICT as hinderance technology beliefs. They may need to develop awareness about educational technology. Also, administration of universities should be cautious about organizing professional development activities related to using mobile technology, developing higher order skills, designing web sites for courses, and supporting disabled students. Since faculty who have higher apathetic beliefs about professional development and higher ICT as hinderance beliefs, can perceive less need in attending some of these activities. Hence, university administrations should try to create awareness/readiness of specifically these faculty members.

The university administration can give the initiative for the establishment of a formal Center for Faculty Development by a volunteer academic team of experts in their disciplines to centralize and organize faculty-centered professional development activities. The results of this study can be used for creating a curriculum for faculty development programs. Faculty Learning Communities can be formed (trans-disciplinary faculty, graduate students, professional staff, 6-15 people getting engeged actively and collaboratively). The model which is designed and implemented in EMU can be a model which can be used by other universities in North Cyprus under the organization of YÖDAK which will enhance common use of expertise within universities.

Whatever faculty beliefs and needs are, an important milestone for professional development is willingness to attend activities, whether online or face-to-face, with diverse formats from seminars or workshops to formal academic training. In this study, 48% of faculty showed interest in participating in an anticipated professional development program by marking an option at the end of the demographics section of the instrument. Although this may give hope for the future, faculty may not show interest because at present there is no formal or systematic development strategy in EMU. As a result, faculty do not have a clear picture of development activities and they are not sure what and how they are going to be offered. In Sydow's (1993) study, individual professional development goals indicated that 86% of respondents would like to attend an activity in the coming years. Another study by Johnson et al. (1998) revealed that most of the faculty (94.4%) reported a need to attend an activity on performance-based education. More research can be listed to confirm that faculty is willing to participate in diverse professional development activities (Kabakçı & Odabaşı, 2008; Kisner et al., 1998; Odabaşı, 2003; Selman & Wilmoth, 1986). University administration should take measures to increase the proportion of faculty members who would be willing to participate in professional development activities.

Furthermore, evaluation of the effectiveness of professional development programs and related activities, and the feedback provided by faculty members are important processes to develop a baseline for sustainability. These evaluation procedures will assist university administrations to improve faculty development strategies.

5.2.2 Suggestions for Further Research

The original survey in this study was carried out some time ago, so the findings of this study identified faculty needs and beliefs at that point in time. It is possible that,

over these years, faculty have become more aware of professional development and that beliefs about ICT-based development may have changed. The needs assessment can be updated to include needs assessment instrument adopting institutional strategies such as internationalization. It is therefore suggested that there will be a follow-up survey to identify current needs and changes in beliefs depending on the context and institutional vision. In addition detailed studies can also be done to identify the competence levels of faculty and compare whether they claimed as 'needed' is what they are 'in need of'.

In view of the fact that faculty beliefs did not have the same level of agreement in terms of professional development with ICT; it is worth investigating the status of technology-enhanced learning environments for identifying beliefs about integrating technology into teaching and learning. This exploration can also set the base of what and how technology is used.

Another suggestion for future study is emphasizing internationalization. Qiang (2003) claims that globalization and technology are changing opportunities; hence, higher education can 'no longer be viewed in a strictly national context'. In order to facilitate internationalization, Stohl (2007) claims that some effort is needed to make faculty believe in the development of scholarship and teaching. EMU recently announced primary policies as internationalization and enhancing educational quality for competing effectively at a global level (Altınay & Ezel, 2012). Research could be conducted in order to investigate faculty needs related to internationalization in teaching and learning, and curriculum. These needs can be suggested to refer to faculty exchange, development in global research projects, teaching abroad, cultural

diversity, and developing an international mindset. McLoughlin (2000) recommends that faculty should have a different mindset embracing different roles such as managers, motivators, mentors, and mediators of learning. This is an important aspect where achieving 'faculty development needs for internationalization' should be identified and addressed to be included in the strategic plans of EMU.

Other then these, mix method research design (quantitative and qualitative) could be used. Since both methods have its own strengths and limitations multiple approaches can help to answer the questions from different aspects where different data collection and data analyses have to be done within a single research paradigm (PREST, 2004). Lichtman (2010) commented about the idea of triangulation when elements from both models are joined in research studies "By gathering data using questionnaires and tests with interviews or observations, researchers would be able to make a stronger case for the quality of their research" (p. 85). Since individual differences and culture may affect the beliefs, it can be suggested to include some demographic information about faculty members such as nationality and country where they got their education. Besides faculty self-reports quantitative and qualitative student evaluations can also be used. This may double check the professional development needs of faculty from students' perspectives.

The instrument can be implemented for confirmatory factor analysis in other universities (inside and outside North Cyprus). And the results can be used to design and develop professional development programs. YÖDAK can use these results to organize joint programs with universities for Faculty Development Workshops

similar to ‘Öğretim Üyesi Geliştirme Çalıştayı’, a program that is conducted during May-June, 2011.

5.2.3 Limitations

The faculty of Eastern Mediterranean University is surveyed in the study for conducting needs assessment and beliefs inventories for professional development. This limitation is related due to the data collected by faculty self-reports. Specifically those reported needs and beliefs may be what they conceive they need or believe, but not what they are really in need of or believe in. It is worth mentioning that there are some arguments about Common Method Bias where some assert that the use of self-reporting raises the relationship between variables (Conway & Lance, 2010). Hence, they are against these ideas that suggest using different methods to overcome bias.

Teaching faculty (professors, associate professors, assistant professors, instructors, senior instructors, and lecturers) employed on a full-time basis participated in the quantitative survey. Part-time faculty members, graduate assistants, and teaching assistants are specifically excluded from this study. Since in EMU there are a substantial number of part-time instructors who have equivalent work load as full-time teaching staff they play an important role in quality of teaching and learning. Hence this can also considered as a limitation of this study.

In this study, beliefs about ICT-based professional development were investigated. It was not considered whether they were familiar with some of the ICT-based development tools mentioned in the items of the instrument. In addition, there was more than one tool in some items which could cause conflict in identifying the

beliefs. Faculty stated that they believe in using specific ICT-based tools for professional development. Another concern is whether they really know or use that particular ICT-based tool. This was a limitation since they should respond that they did not believe in it since they were not familiar with the tool or its uses for learning.

These results reflect self-reports of faculty members of EMU. It may not be possible to generalize it to different cultures or adapt directly to universities in different parts of the world. Although it can be possible that other institutions can take it as a model and adapt.

5.2.4 Concluding Remarks

The outcome of this study can be used for designing an ICT-based professional development model that is suitable for faculty needs and beliefs as well as for their individual and institutional culture. These findings can be important to identify the faculty profile for future professional development strategies. This exploration may open the gate for planning and designing ICT-based professional development models which may be a first step to the formation of faculty development.

There are many studies that relate beliefs to attitudes, efficacy, goals, and practices but there are very few studies that include both beliefs and needs. Studies that relate beliefs about professional development and beliefs about ICT-based could not be accessed literature reviewed. Beliefs and needs are two important aspects that affect the professional development of teachers. Both have been investigated for decades to contribute to the improvement of professional development. However, they have often been considered as distinct from one another, except by Kalivoda et al. (1993) and McLoughlin (2000), in whose research faculty beliefs and needs play a central

role. From this study it could be said that since a correlation exists, beliefs of the faculty form the basis of their needs.

This research considered the beliefs of faculty in two dimensions; professional development in teaching and learning and ICT-based professional development in teaching and learning. The former has two factors such as enthusiastic beliefs and apathetic beliefs. The second dimension has also two factors which help to focus on beliefs about ICT as assistive technology and ICT as hindering technology. The findings and their relation to the EMU faculty demographics have been examined and finally the correlation between beliefs and needs was considered. The importance of this study was investigating the connection between beliefs and needs for faculty development purposes in the case of an international university. The highest perceived needs as a result of analysis of data collected in EMU were not very different from other results of needs analysis studies conducted in various countries at different higher institutions.

There are some results that are calling attention to be emphasized in future professional development programs. Planning should take into consideration the differences of skills and levels of faculty members from various disciplines and academic units. Being neutral about beliefs in ICT hinderance may expose a need to clarify the positive role of using ICT for professional development. Topper (2000) also commented that faculty beliefs and knowledge shape plans for technology use in teaching and learning. Some specific needs and problems related to sub-groups (laboratory work) can be investigated and those who have primary interest have to be considered for institutional strategic decisions. Another investigation should be the

highest need for supporting students with disabilities, whether disability in this item is perceived by faculty as ‘learning disabilities’.

Adequately, the results achieved from this research were consistent. One of the reasons may be the participants were all faculty members who were adults and teachers. Following can be their enthusiasm about professional development in teaching and learning, and they were committed and willing to respond.

The outcomes of this study are expected to trigger professional development efforts in EMU which will enlighten and guide the path toward the European Higher Education Area. The faculty members are ready to develop and as a result of this EMU should get ready and prepare strategies for improving quality in teaching and learning. Therefore, this study can hopefully be the first step in shaping future professional development strategies for EMU faculty which can be a model for other universities in North Cyprus and other developing countries. In addition to determining beliefs about professional development in general and about ICT-based professional development in particular, it will also identify the competence topics where faculty needs to develop.

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APPENDICES

Appendix A: Faculty Professional Development Survey (Final Version)

Personal Information

*Please mark the appropriate box in this section about **your** personal information.*

Gender

☐ Female ☐ Male

Status

☐ Full-time ☐ Part-time

Academic Position

☐ Professor ☐ Associate Professor ☐ Assistant Professor

☐ Senior Instructor ☐ Instructor/ Lecturer

Field of Study

☐ Architecture	☐ Business and Economics	☐ Communication and Media Studies
☐ Computing and Technology	☐ Engineering	☐ Fine or Performing Arts
☐ Humanities	☐ Physical or Natural Sciences	☐ Social or Behavioral Sciences
☐ Teacher Education	☐ Tourism and Hospitality Management	*Other*

Faculty/ School/ Department

☐ Applied Disciplines	☐ Architecture	☐ Arts and Sciences
☐ Business and Economics	☐ Communication	☐ Computing and Technology
☐ Education	☐ Engineering	☐ General Education
☐ Law	☐ Tourism and Hospitality Management	*Other*

Teaching Experience

☐ 1-7 years ☐ 8-14 years ☐ 15-21 years ☐ Over 21 years

Participation

(You may answer the following questions after you complete the instruments.)

If a professional development activity will be arranged as a part of this study, would you like to attend?

☐ Yes ☐ No

If yes, please provide your contact info:

Name & Surname _____ E-mail/ Mobile _____

Faculty Needs Assessment Questionnaire for Professional Development in Teaching and Learning

(FNATAL)

*The following statements are some professional development topics related to teaching and learning. The aim is to identify the topics that you need to learn more about it. You can find details about the topic on the left. On the scale **0** shows **no** need, **1** shows the **lowest** level and **5** shows the **highest** level of the needs. Please select your level of need in professional development on the topics listed below.*

Terms		Needs	No Need	Low				High
			0	1	2	3	4	5
	A	**Curriculum**						
Curriculum development process: A quality curriculum development process addresses content (what students should learn, be able to do, and be committed to), teaching (how it is taught), assessment (how it is measured), and context (how the educational system is organized).	1	Curriculum development process	o	o	o	o	o	o
Course designing: Establishing the need and demanding for the course and student characteristics, determining content, setting goals and objectives, choosing teaching and assessment methods, and implementing, evaluating and adjusting required components.	2	Course designing: aligning goals, methods, and assessment	o	o	o	o	o	o
	3	Designing learning activities, assignments, and projects	o	o	o	o	o	o
Modifying curriculum: Modifying course syllabus, course objectives, and lesson plans to meet the individual needs of all students.	4	Modifying curriculum	o	o	o	o	o	o
Evaluating the curriculum: An ongoing process of collecting, analyzing, synthesizing, and interpreting information to ensure that the written and delivered curriculum is having the desired effect for students.	5	Evaluating the curriculum	o	o	o	o	o	o
		Other	o	o	o	o	o	o
	B	**Teaching and learning methods**						
Cooperative learning: Students work together in small groups, share their knowledge and develop their own answer through interaction and reaching consensus.	6	Cooperative learning	o	o	o	o	o	o
Problem-based learning: Student-centered teaching strategy in which students collaboratively solve problems and reflect on their experiences with support from a teacher.	7	Problem-based learning	o	o	o	o	o	o
Case-based learning: Focuses on a group of students building knowledge and working together to examine specific real-life situations where the teacher's role is a facilitator.	8	Case-based learning	o	o	o	o	o	o
Discovery-based learning: Student-centered teaching method creates an active learning environment where students solve problem situations based on their own experience and prior knowledge (learn by doing).	9	Discovery-based learning	o	o	o	o	o	o
Group discussion: Effective classroom method that facilitates students' thinking constructively while interacting with the rest of the group.	10	Group discussion	o	o	o	o	o	o
Team teaching: A group of teachers working purposefully, regularly, and collaboratively to teach a group of students.	11	Team teaching	o	o	o	o	o	o

Developing higher order skills in students: Developing the ability to think creatively, make decisions, solve problems, visualize, reason, analyze, interpret, and learn how to learn.

Supporting interdisciplinary teaching and learning: Accessing and integrating knowledge from different sources and disciplines.

Learning styles: Learning styles are the students' preferences for learning (i.e. visual, auditory, and tactile/kinesthetic).

Using audio and/or visual media technology: Effective use of technology such as film or slide projectors, tape recorders, television, video, camcorders, interactive whiteboards, opaque projectors, overhead projectors etc. for teaching purposes.

Computer aided instruction: Interactive computer programs that deliver instruction through animation, sound, and demonstration and give immediate feedback to the learner to facilitate progress at their own pace.

Developing a course Web site: To design and develop a representative and informative course Web site to make use of the Internet for learning.

Developing and teaching a hybrid course: Hybrid courses blend in-class teaching and online learning, although time traditionally spent in the classroom is reduced but not eliminated.

Taking advantage of online courses: Online courses can be used either interactively using activity modules (i.e. blogs, forums, wikis, database) or only to deliver content to students and assess learning using assignments or quizzes.

Using mobile technology for learning: Using portable computing devices (i.e. smart phones, laptops, PDAs, and tablet PCs) with wireless networks enables mobility, and mobile learning gives teachers and learners increased flexibility and interaction beyond the traditional classroom.

Student-centered teaching and learning: A teaching and learning approach which focuses on the student's needs, abilities, interests, and learning styles with the teacher as a facilitator of learning.

Evaluating teaching: Evaluating the effectiveness of the teacher through the assessment of student achievement.

Preparing effective teaching materials: Methods for preparing, selecting, and developing media and teaching materials such as notes, labs, worksheets, handouts, practice problems, and solutions, slide presentations, motion pictures, audio or video recordings, podcasts, webcasts.

Building positive teaching and learning environment: Creating a positive learning environment in the classroom to allow students feel comfortable, safe and engaged, and willing to actively participate in classroom activities.

	Needs	0	1	2	3	4	5
12	Developing higher order skills in students (critical thinking, problem solving, etc.)	o	o	o	o	o	o
13	Supporting interdisciplinary teaching and learning	o	o	o	o	o	o
14	Learning styles and using them for teaching	o	o	o	o	o	o
	Other	o	o	o	o	o	o
C	**Instructional Technology**						
15	Using audio and/or visual media technology in teaching	o	o	o	o	o	o
16	Developing and using computer-aided instruction	o	o	o	o	o	o
17	Developing a course Web site	o	o	o	o	o	o
18	Developing and teaching a hybrid (online and face-to-face) course	o	o	o	o	o	o
19	Taking advantage of online/ web-based courses	o	o	o	o	o	o
20	Using mobile technology for learning	o	o	o	o	o	o
	Other	o	o	o	o	o	o
D	**Teaching Environment**						
21	Using the lecture method effectively	o	o	o	o	o	o
22	Student-centered teaching and learning	o	o	o	o	o	o
23	Evaluating teaching	o	o	o	o	o	o
24	Preparing effective teaching materials	o	o	o	o	o	o
25	Building positive teaching and learning environment in the classroom	o	o	o	o	o	o
26	Motivating students effectively	o	o	o	o	o	o
27	Managing discussions in the classroom	o	o	o	o	o	o

		Needs	0	1	2	3	4	5
Academic integrity and standards: Setting up policies and regulations on maintaining academic integrity by setting and clarifying academic standards, using assignments and test formats that discourage cheating and plagiarism, and encouraging students to be honest.	28	Maintaining academic integrity and standards	o	o	o	o	o	o
	29	Dealing with difficult students	o	o	o	o	o	o
	30	Resolving teacher-student conflicts	o	o	o	o	o	o
Writing effective essay exams: Characteristics of effective open-ended short essay and extended essay questions and teacher's development in preparation and use of essay exams.	31	Writing effective essay exams	o	o	o	o	o	o
Writing effective objective tests: Designing test questions (true-false, multiple-choice, short answer, completion, matching, and essay).	32	Writing effective objective tests	o	o	o	o	o	o
Developing and grading written assignments and projects: Developing grading criteria for writing, editing, and designing assignments and projects to help students to understand the assessment procedure.	33	Developing and grading written assignments and projects	o	o	o	o	o	o
		Other	o	o	o	o	o	o
	E	**Assessment**						
	34	Developing and grading laboratory assignments	o	o	o	o	o	o
	35	Using and evaluating portfolios and e-portfolios	o	o	o	o	o	o
Using research techniques to develop classroom instruction: Action research is a reflective process that helps the teacher to develop problem solving skills, detect problems, and assess their teaching methods.	36	Using research techniques to develop classroom instruction	o	o	o	o	o	o
		Other	o	o	o	o	o	o
	F	**Student Support and Guidance**						
Understanding and using classroom assessment techniques: A set of simple, non-graded, anonymous, in-class activities techniques for giving useful feedback to the teacher and the learner on the teaching-learning process.	37	Understanding and using classroom activities	o	o	o	o	o	o
Understanding cognitive development of students: Theories of student cognitive development that address a set of meaning-making structures through which the student perceives, organizes, and reasons about their learning experiences.	38	Understanding cognitive development of students	o	o	o	o	o	o
	39	Teaching and supporting adult learners	o	o	o	o	o	o
Giving students effective advice for studying and better learning: Advice for students about effective learning at university to fully understand how to learn and study.	40	Giving students effective advice for studying and better learning	o	o	o	o	o	o
Learning about student's learning styles, characteristics, and needs: Students with different learning styles, characteristic strengths and preferences in the ways they take in and process information (i.e. learn on facts, theories, visual, verbal, active and interactive).	41	Learning about students' learning styles, characteristics, and needs	o	o	o	o	o	o
Supporting students with disabilities: Identify the difficulties and barriers in relation to the learning of disabled students and provide efficient support.	42	Supporting students with disabilities	o	o	o	o	o	o
Teaching students how to learn: Teachers help students become more effective learners by strategic use of different learning strategies and skills, motivational processes and self-regulation that results in positive learning outcomes.	43	Teaching students how to learn	o	o	o	o	o	o
		Other	o	o	o	o	o	o

Faculty Beliefs Inventory for Professional Development in Teaching and Learning

(FBITAL)

*Listed below are a number of statements about professional development in teaching and learning. Please read each statement and **express your belief** in it by indicating how much you agree with it on the scale from **Strongly Disagree** to **Strongly Agree.***

	Beliefs	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
1	Professional development empowers faculty members with skills for effective education from the beginning of their career until retirement.	o	o	o	o	o
2	Faculty members' attendance at professional development activities will improve students' quality of learning.	o	o	o	o	o
3	I am already too overloaded so I do not have time to participate in professional development activities.	o	o	o	o	o
4	I benefit from my colleagues' opinions and evaluation on my teaching.	o	o	o	o	o
5	I am interested in learning and using more effective methods to teach my courses.	o	o	o	o	o
6	Faculty members should value excellence in teaching.	o	o	o	o	o
7	I do not have energy for attending professional development activities.	o	o	o	o	o
8	Faculty members have to use Internet and computer technologies for professional development in teaching.	o	o	o	o	o
9	There is no need to use special teaching methods in classroom since it is the students' responsibility to learn.	o	o	o	o	o
10	I am interested in participating in professional development activities offered by expert faculty members.	o	o	o	o	o
11	Teaching is not a special skill, so everyone who is knowledgeable in a discipline can teach.	o	o	o	o	o
12	I am already a good teacher so I do not need to improve my teaching.	o	o	o	o	o
13	Reading books, training materials, and other sources on teaching and learning will develop my teaching.	o	o	o	o	o
14	Informal conversations with my colleagues about teaching give me ideas for making adaptations in my courses.	o	o	o	o	o
15	Students' evaluation of my teaching are useful to adjust my teaching strategy.	o	o	o	o	o
16	Faculty members' professional development in teaching and learning will improve the quality of education at the university.	o	o	o	o	o
17	Faculty members can develop their courses by doing research and implementing the results.	o	o	o	o	o
18	Collaboration among faculty members about teaching and learning helps their professional development.	o	o	o	o	o
19	Professional development activities and resources empower faculty members.	o	o	o	o	o
20	Graduate training is sufficent for a new faculty member to become a good teacher.	o	o	o	o	o
21	There is no advantage of discussing issues and problems about teaching and learning with a group of colleagues.	o	o	o	o	o
22	In this knowledge age, I should follow changes in theories, methods, technologies, and new paradigms of teaching and learning.	o	o	o	o	o

Faculty Beliefs Inventory for ICT-based Professional Development in Teaching and Learning

(FBIICT)

*Listed below are a number of statements about ICT (Information and Communication Technologies) -based professional development in teaching and learning. Please read each statement and **express your belief** in it by indicating how much you agree with it on the scale from **Strongly Disagree** to **Strongly Agree.***

	Beliefs	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
1	Using ICT (computers, Internet, etc.) facilitates faculty members' professional development.	o	o	o	o	o
2	Participating in ICT-based professional development activities enhances my use of technology.	o	o	o	o	o
3	ICT has the potential of great flexibility for learning anytime, anywhere, and at any pace.	o	o	o	o	o
4	Watching videos or animations about teaching approaches is a convenient way of learning for faculty	o	o	o	o	o
5	Mailing lists (Listservs, Newsgroups, etc.) are important tools for exchanging ideas with colleagues anywhere.	o	o	o	o	o
6	It is rather difficult for me to participate in online professional development activities.	o	o	o	o	o
7	Using slides, videos, and podcasts prepared by expert faculty members cannot help my professional development.	o	o	o	o	o
8	Web-based learning environments are not practical for me for professional development.	o	o	o	o	o
9	Professional online networks facilitate global collaboration with colleagues from all over the world.	o	o	o	o	o
10	Sharing my ideas or problems on teaching and learning on online media helps me get feedback.	o	o	o	o	o
11	E-mails, chat programs, Skype, instant messaging, etc. are not suitable for me to communicate for professional	o	o	o	o	o
12	I don't have a preference to participate in online conferences although there is no need to travel.	o	o	o	o	o
13	Recording and watching videos about my teaching helps me develop in teaching and learning.	o	o	o	o	o
14	Social networks (Facebook, Twitter, LinkedIn, MyNet, etc.) create opportunities for faculty members to	o	o	o	o	o
15	ICT allow me to choose the learning materials according to my competence and my learning style.	o	o	o	o	o
16	Social bookmarking services (Delicious, Diigo, etc.) which facilitate keeping and sharing links to resources	o	o	o	o	o

Appendix B: Faculty Belief Inventories used for Reliability

Faculty Beliefs Inventory for Professional Development in Teaching and Learning

(FBITAL)

*Listed below are a number of statements about professional development in teaching and learning. Please read each statement and **express your belief** in it by indicating how much you agree with it on the scale from **Strongly Disagree** to **Strongly Agree**.*

	Beliefs	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
1	Professional development empowers faculty members with skills for effective education from the beginning of their career until retirement.	o	o	o	o	o
2	Faculty members' attendance at professional development activities will improve students' quality of learning.	o	o	o	o	o
3	I am already too overloaded so I do not have time to participate in professional development activities.	o	o	o	o	o
4	I benefit from my colleagues' opinions and evaluation on my teaching.	o	o	o	o	o
5	I am interested in learning and using more effective methods to teach my courses.	o	o	o	o	o
6	Faculty members should value excellence in teaching.	o	o	o	o	o
7	I do not have energy for attending professional development activities.	o	o	o	o	o
8	Faculty members have to use Internet and computer technologies for professional development in teaching.	o	o	o	o	o
9	There is no need to use special teaching methods in classroom since it is the students' responsibility to learn.	o	o	o	o	o
10	I am interested in participating in professional development activities offered by expert faculty members.	o	o	o	o	o
11	Teaching is not a special skill, so everyone who is knowledgeable in a discipline can teach.	o	o	o	o	o
12	I am already a good teacher so I do not need to improve my teaching.	o	o	o	o	o
13	Reading books, training materials, and other sources on teaching and learning will develop my teaching.	o	o	o	o	o
14	Informal conversations with my colleagues about teaching give me ideas for making adaptations in my courses.	o	o	o	o	o
15	Students' evaluation of my teaching are useful to adjust my teaching strategy.	o	o	o	o	o
16	Faculty members' professional development in teaching and learning will improve the quality of education at the university.	o	o	o	o	o
17	Faculty members can develop their courses by doing research and implementing the results.	o	o	o	o	o
18	Collaboration among faculty members about teaching and learning helps their professional development.	o	o	o	o	o
19	Professional development activities and resources empower faculty members.	o	o	o	o	o
20	Graduate training is sufficent for a new faculty member to become a good teacher.	o	o	o	o	o
21	There is no advantage of discussing issues and problems about teaching and learning with a group of colleagues.	o	o	o	o	o
22	In this knowledge age, I should follow changes in theories, methods, technologies, and new paradigms of teaching and learning.	o	o	o	o	o

Faculty Beliefs Inventory for ICT-based Professional Development in Teaching and Learning

(FBIICT)

*Listed below are a number of statements about ICT (Information and Communication Technologies) -based professional development in teaching and learning. Please read each statement and **express your belief** in it by indicating how much you agree with it on the scale from **Strongly Disagree** to **Strongly Agree**.*

	Beliefs	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
1	Using ICT (computers, Internet, etc.) facilitates faculty members' professional development.	o	o	o	o	o
2	My biggest obstacle to learning with new technologies is not finding sufficient time to spare.	o	o	o	o	o
3	Participating in ICT-based professional development activities enhances my use of technology.	o	o	o	o	o
4	ICT has the potential of great flexibility for learning anytime, anywhere, and at any pace.	o	o	o	o	o
5	Watching videos or animations about teaching approaches is a convenient way of learning for faculty members.	o	o	o	o	o
6	Mailing lists (Listservs, Newsgroups, etc.) are important tools for exchanging ideas with colleagues	o	o	o	o	o
7	It is rather difficult for me to participate in online professional development activities.	o	o	o	o	o
8	Using slides, videos, and podcasts prepared by expert faculty members cannot help my professional development.	o	o	o	o	o
9	Web-based learning environments are not practical for me for professional development.	o	o	o	o	o
10	Professional online networks facilitate global collaboration with colleagues from all over the world.	o	o	o	o	o
11	Sharing my ideas or problems on teaching and learning on online media helps me get feedback.	o	o	o	o	o
12	E-mails, chat programs, Skype, instant messaging, etc. are not suitable for me to communicate for professional development purposes.	o	o	o	o	o
13	I don't have a preference to participate in online conferences although there is no need to travel.	o	o	o	o	o
14	Recording and watching videos about my teaching helps me develop in teaching and learning.	o	o	o	o	o
15	Social networks (Facebook, Twitter, LinkedIn, MyNet, etc.) create opportunities for faculty members to disseminate professional opinions informally.	o	o	o	o	o
16	ICT allow me to choose the learning materials according to my competence and my learning style.	o	o	o	o	o
17	Social bookmarking services (Delicious, Diigo, etc.) which facilitate keeping and sharing links to resources help my professional development.	o	o	o	o	o

Appendix C: Cover Letters

Letter for Expert Reviewers

Dear Professor,

I am a PhD student in Educational Sciences Department of Eastern Mediterranean University (EMU) in Famagusta, North Cyprus. The title of my doctoral study is "Effectiveness of ICT-Based Models to Fulfill Faculty Professional Development Needs in EMU". The purpose is to explore the faculty's professional development needs in teaching and learning in EMU, and the effectiveness of professional development models implemented aiming at their professional development. The following are my research questions:

1. *What are the faculty's needs for professional development in teaching and learning?*
2. *Do the faculty's needs in teaching and learning vary depending on (a) their genders, (b) their academic status, (c) their study areas, (d) departments, and (e) their teaching experience?*
3. *What are the faculty's beliefs about professional development in teaching and learning?*
4. *What are the faculty's beliefs about ICT-based learning opportunities for professional development in teaching and learning?*
5. *Which ICT-based models are effective for faculty's professional development in teaching and learning?*

I have prepared a survey including three instruments to respond these questions. I am attaching it for your valuable reviews and remarks. You are expected to do your contribution according to:

A. *The intend of the first instrument FNATAL is to identify the professional development needs of faculty in teaching and learning (Research question 1). Please go thru each item and consider the **clarity, content, instructions, and use of technical terms** for faculty professional development needs in teaching and learning. Each item has an expert view column on the right side. Reply whether this item is "Relevant" to the aim of this instrument by checking the selection box on the right side of that item. If you think it is not relevant click "no", and then please write your view inside the comment form box. At the end there is another part for your views. Here consider the whole instrument considering the **design, instructions, and general points** and write your comments.*

B. *Second instrument FBITAL is prepared to identify the beliefs of faculty on professional development in teaching and learning (Research question 3). Examine each individual item and consider the **clarity, content, instructions, sensitivity/bias, and use of technical terms** to identify faculty's beliefs in professional development in teaching and learning. Each item has an expert view column on the right side. Reply whether this item is "Relevant" to the aim of this instrument by checking the selection box on the right side of that item. If you think it is not relevant click "no", and then please write your view inside the comment form box. At the end there is another part for your views. Here consider the whole instrument considering the **design, instructions, and general points** and write your comments.*

C. *FBIICT is the last instrument prepared with the aim of identifying faculty's beliefs in using ICT for professional development purposes in teaching and learning (Research question 4). Examine each individual item and consider the **clarity, content, instructions, sensitivity/bias, and use of technical terms** to identify faculty's beliefs in professional development in teaching and learning. Each item has an expert view column on the right side. Reply whether this item is "Relevant" to the aim of this instrument by checking the selection box on the right side of that item. If you think it is not relevant click "no", and then please write your view inside the comment form box. At the end there is another part for your views. Here consider the whole instrument considering the **design, instructions, and general points** and write your comments.*

After filling up the form please e-mail the completed expert view document to me (alev.elci@emu.edu.tr). In advance I would like to thank you for taking your time and effort to contribute to the survey. Your role in this process is appreciated and it will enlighten my course for preparing this survey. With my regards,

Alev Elçi

Cover Letter for Pilot Study

Faculty Professional Development Survey

Dear Faculty Member,

This faculty survey has been prepared to serve the purpose of identifying Eastern Mediterranean University (EMU) faculty member's professional development needs and beliefs. Professional development allows the faculty member to maintain, improve, and broaden their knowledge and skills in their profession and development of their competence during their professional lives. Faculty professional development in teaching and learning is for improving their courses, their own teaching, and their students' learning. Integrating information, computing and communications systems (Information and Communication Technologies - ICT) in this lifelong learning process will provide opportunities to innovative and flexible forms of learning and expand faculty's learning environment. This survey concentrates on the professional development needs and beliefs solely in teaching role of faculty. To collect the data from you as faculty members of EMU, the following questionnaires will be used. There are 4 sections of this survey:

1. *Personal information.*
2. *FNATAL (Faculty Needs Assessment for professional development in Teaching and Learning. The aim of this section is to identify the level of faculty needs for professional development in teaching and learning.*
3. *FBITAL (Faculty Beliefs Inventory for professional development in Teaching and Learning). The aim of this section is to identify faculty beliefs on professional development in teaching and learning.*
4. *FBIICT (Faculty Beliefs Inventory for professional development using Information and Communication Technologies). The aim of this section is to identify faculty beliefs on using ICT for professional development in teaching and learning.*

I anticipate that the outcome of this research will be useful in designing suitable professional development activities to serve you. The quality of the results of this research would depend on how much your answers show your real needs and beliefs about professional development and ICT. Kindly complete all of the sections and items. It will take approximately 25 minutes to respond to the survey.

I appreciate your cooperation and punctuality.

Alev Elçi

Faculty Professional Development Survey

Dear Faculty Member,

This faculty survey has been prepared to serve the purpose of identifying University faculty members' professional development beliefs. Professional development allows the faculty members to maintain, improve, and broaden their knowledge and skills in their profession and development of their competence during their professional lives. Faculty professional development in teaching and learning is for improving their courses, their own teaching, and their students' learning. Integrating information, computing and communications systems (Information and Communication Technologies - ICT) in this lifelong learning process will provide opportunities to innovative and flexible forms of learning and expand faculty members' learning environment. This survey concentrates on the professional development beliefs solely in teaching role of faculty. To collect the data from you as faculty members, the following instrument pack will be used. The instrument pack consists of a personal information section at the beginning and two different instruments. The following are the instruments:

1. ***Faculty Beliefs Inventory for Professional Development in Teaching and Learning (FBITAL).***
   The aim of this instrument is to identify faculty members' beliefs on professional development in teaching and learning.

2. ***Faculty Beliefs Inventory for ICT (Information and Communication Technologies) -based Professional Development in Teaching and Learning (FBIICT).***
   The aim of this instrument is to identify faculty members' beliefs on using ICT for professional development in teaching and learning.

I anticipate that the outcome of this research will be useful in designing suitable professional development activities to serve faculty. The quality of the results of this research would depend on how much your answers show your real beliefs about professional development and ICT. Kindly complete all of the instruments and items. The results of this survey will be used for only research purposes and will be kept strictly confidential. You are expected to kindly complete all items in the instruments frankly. It will take approximately 20 minutes to respond to the survey.

Thank you very much for your cooperation and punctuality.

Alev Elçi

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Cover Letter for Faculty Professional Development Survey

Faculty Professional Development Survey

Dear Faculty Member,

This faculty survey has been prepared to serve the purpose of identifying Eastern Mediterranean University (EMU) faculty members' professional development needs and beliefs. Professional development allows the faculty members to maintain, improve, and broaden their knowledge and skills in their profession and development of their competence during their professional lives. Faculty professional development in teaching and learning is for improving their courses, their own teaching, and their students' learning. Integrating information, computing and communications systems (Information and Communication Technologies - ICT) in this lifelong learning process will provide opportunities to innovative and flexible forms of learning and expand faculty members' learning environment. This survey concentrates on the professional development needs and beliefs solely in teaching role of faculty. To collect the data from you as faculty members of EMU, the following instrument pack will be used. The instrument pack consists of a personal information section at the beginning and three different instruments. The following are the instruments:

1. ***Faculty Needs Assessment Questionnaire for Professional Development in Teaching and Learning (FNATAL).*** *The aim of this instrument is to identify the faculty members' needs for professional development in teaching and learning.*
2. ***Faculty Beliefs Inventory for Professional Development in Teaching and Learning (FBITAL).*** *The aim of this instrument is to identify faculty members' beliefs on professional development in teaching and learning.*
3. ***Faculty Beliefs Inventory for ICT (Information and Communication Technologies) -based Professional Development in Teaching and Learning (FBIICT).***
   The aim of this instrument is to identify faculty members' beliefs on using ICT for professional development in teaching and learning.

I anticipate that the outcome of this research will be useful in designing suitable professional development activities to serve you. The quality of the results of this research would depend on how much your answers show your real needs and beliefs about professional development and ICT. Kindly complete all of the instruments and items. The results of this survey will be used for only research purposes and will be kept strictly confidential. You are expected to kindly complete all items in the instruments frankly. It will take approximately 30 minutes to respond to the survey.

Thank you very much for your cooperation and punctuality.

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Appendix D: FNATAL

Table D1: Descriptive statistics for faculty needs in categories

	Needs	
FNATAL	Mean±SD*	Median (Min-Max)*
A. Curriculum		
1. Curriculum development process	2.75±1.7	3 (0-5)
2. Course designing: aligning goals, methods, and assessment	2.76±1.7	3 (0-5)
3. Designing learning activities, assignments, and projects	2.72±1.7	3 (0-5)
4. Modifying curriculum	*2.67±1.6*	*3 (0-5)*
5. Evaluating the curriculum	**2.91±1.6**	**3 (0-5)**
Average	2.77±1.5	3 (0-5)

Table D1: Descriptive statistics for faculty needs in categories (cont.)

FNATAL	Needs	
	Mean±SD*	Median (Min-Max)*
B. Teaching and Learning Methods		
6. Cooperative learning	2.72±1.7	3 (0-5)
7. Problem-based learning	2.74±1.7	3 (0-5)
8. Case-based learning	2.63±1.7	3 (0-5)
9. Discovery-based learning	2.77±1.7	3 (0-5)
10. Group discussion	2.63±1.7	3 (0-5)
11. Team teaching	*2.46±1.6*	*2 (0-5)*
12. Developing higher order skills in students (critical thinking, problem solving, etc.)	**3.06±1.7**	**3 (0-5)**
13. Supporting interdisciplinary teaching and learning	2.93±1.6	3 (0-5)
15. Learning styles and using them for teaching	2.76±1.5	3 (0-5)
Average	2.73±1.4	3 (0-5)

Table D1: Descriptive statistics for faculty needs in categories (cont.)

FNATAL	Needs	
	Mean±SD*	Median (Min-Max)*
C. Instructional Technology		
16. Using audio and/or visual media technology in teaching	2.78±1.7	3 (0-5)
17. Developing and using computer-aided instruction	2.79±1.7	3 (0-5)
18. Developing a course Web site	**2.98±1.8**	**3 (0-5)**
19. Developing and teaching a hybrid (online and face-to-face) course	2.65±1.7	3 (0-5)
20. Taking advantage of online/ web-based Courses	2.61±1.6	3 (0-5)
21. Using mobile technology for learning	*2.59±1.7*	*3 (0-5)*
Average	2.72±1.3	3 (0-5)

Table D1: Descriptive statistics for faculty needs in categories (cont.)

	Needs	
FNATAL	Mean±SD*	Median (Min-Max)*
D. Teaching Environment		
22. Using the lecture method effectively	2.56±1.8	3 (0-5)
23. Student-centered teaching and learning	2.80±1.6	3 (0-5)
24. Evaluating teaching	2.83±1.7	3 (0-5)
25. Preparing effective teaching materials	**2.99±1.7**	**3 (0-5)**
26. Building positive teaching and learning environment in the classroom	2.67±1.9	3 (0-5)
27. Motivating students effectively	2.83±1.9	3 (0-5)
28. Managing discussions in the classroom	2.70±1.9	3 (0-5)
29. Maintaining academic integrity and standards	2.71±1.9	3 (0-5)
30. Dealing with difficult students	2.80±1.7	3 (0-5)
31. Resolving teacher-student conflicts	2.55±1.7	3 (0-5)
32. Writing effective essay exams	*2.41±1.7*	*2 (0-5)*
33. Writing effective objective tests	2.45±1.7	2 (0-5)
34. Developing and grading written assignments and projects	2.51±1.8	2 (0-5)
Average	2.68±1.7	3 (0-5)

Table D1: Descriptive statistics for faculty needs in categories (cont.)

	Needs	
FNATAL	Mean±SD*	Median (Min-Max)*
E. Assessment		
35. Developing and grading laboratory assignments	*2.04±1.8*	*2 (0-5)*
36. Using and evaluating portfolios and e-portfolios	2.25±1.7	2 (0-5)
42. Using research techniques to develop classroom instruction	**2.56±1.6**	**3 (0-5)**
Average	2.40±1.4	2.5 (0-5)

Table D1: Descriptive statistics for faculty needs in categories (cont.)

FNATAL	Needs	
	Mean±SD*	Median (Min-Max)*
F. Student Support and Guidance		
38. Understanding and using classroom activities techniques	2.54±1.6	3 (0-5)
39. Understanding cognitive development of Students	2.75±1.5	3 (0-5)
40. Teaching and supporting adult learners	*2.43±1.5*	*3 (0-5)*
41. Giving students effective advice for studying and better learning	2.60±1.8	3 (0-5)
42. Learning about students' learning styles, characteristics, and needs	2.75±1.6	3 (0-5)
43. Supporting students with disabilities	**3.16±1.7**	**3 (0-5)**
44. Teaching students how to learn	3.04±1.8	3 (0-5)
Average	2.76±1.4	3 (0-5)

Bold numbers indicate highest need in that category, italic ones indicate lowest need in that category

Table D2: Descriptive statistics for faculty needs sorted

Rank		Needs		Category
		Mean±SD*	Median (Min-Max)*	
1	Supporting students with disabilities	3.16±1.7	3 (0-5)	Student Support and Guidance
2	Developing higher order skills in students (critical thinking, problem solving, etc.)	3.06±1.8	3 (0-5)	Teaching and Learning Methods
3	Teaching students how to learn	3.04±1.7	3 (0-5)	Student Support and Guidance
4	Preparing effective teaching materials	2.99±1.7	3 (0-5)	Teaching Environment
5	Developing a course Web site	2.98±1.8	3 (0-5)	Instructional Technology
6	Supporting interdisciplinary teaching and learning	2.93±1.6	3 (0-5)	Teaching and Learning Methods
7	Evaluating the curriculum	2.91±1.6	3 (0-5)	Curriculum
8	Evaluating teaching	2.83±1.7	3 (0-5)	Teaching Environment
9	Motivating students effectively	2.83±1.9	3 (0-5)	Teaching Environment

Table D2: Descriptive statistics for faculty needs sorted (cont.)

Rank		Needs		Category
		Mean±SD*	Median (Min-Max)*	
10	Student-centered teaching and learning	2.80±1.6	3 (0-5)	Teaching Environment
11	Dealing with difficult students	2.80±1.6	3 (0-5)	Teaching Environment
12	Developing and using computer-aided instruction	2.79±1.7	3 (0-5)	Instructional Technology
13	Using audio and/or visual media technology in teaching	2.78±1.7	3 (0-5)	Instructional Technology
14	Discovery-based learning	2.77±1.7	3 (0-5)	Teaching and Learning Methods
15	Course designing: aligning goals, methods, and assessment	2.76±1.7	3 (0-5)	Curriculum
16	Learning styles and using them for teaching	2.76±1.5	3 (0-5)	Teaching and Learning Methods
17	Learning about students' learning styles, characteristics, and needs	2.75±1.6	3 (0-5)	Student Support and Guidance

Table D2: Descriptive statistics for faculty needs sorted (cont.)

Rank		Needs		Category
		Mean±SD*	Median (Min-Max)*	
18	Understanding cognitive development of Students	2.75±1.5	3 (0-5)	Student Support and Guidance
19	Curriculum development process	2.75±1.7	3 (0-5)	Curriculum
20	Problem-based learning	2.74±1.7	3 (0-5)	Teaching and Learning Methods
21	Cooperative learning	2.72±1.7	3 (0-5)	Teaching and Learning Methods
22	Designing learning activities, assignments, and projects	2.72±1.7	3 (0-5)	Curriculum
23	Maintaining academic integrity and standards	2.71±1.9	3 (0-5)	Teaching Environment
24	Managing discussions in the classroom	2.70±1.9	3 (0-5)	Teaching Environment
25	Building positive teaching and learning environment in the classroom	2.67±1.9	3 (0-5)	Teaching Environment

Table D2: Descriptive statistics for faculty needs sorted (cont.)

Rank		Needs		Category
		Mean±SD*	Median (Min-Max)*	
26	Modifying curriculum	2.67±1.6	3 (0-5)	Curriculum
27	Developing and teaching a hybrid (online and face-to-face) course	2.65±1.7	3 (0-5)	Instructional Technology
28	Group discussion	2.63±1.7	3 (0-5)	Teaching and Learning Methods
29	Case-based learning	2.63±1.7	3 (0-5)	Teaching and Learning Methods
30	Taking advantage of online/ web-based Courses	2.61±1.6	3 (0-5)	Instructional Technology
31	Giving students effective advice for studying and better learning	2.60±1.8	3 (0-5)	Student Support and Guidance
32	Using mobile technology for learning	2.59±1.7	3 (0-5)	Instructional Technology
33	Using the lecture method effectively	2.56±1.8	3 (0-5)	Teaching Environment

Table D2: Descriptive statistics for faculty needs sorted (cont.)

Rank		Needs		Category
		Mean±SD*	Median (Min-Max)*	
34	Using research techniques to develop classroom instruction	2.56±1.6	3 (0-5)	Assessment
35	Resolving teacher-student conflicts	2.55±1.7	3 (0-5)	Teaching Environment
36	Understanding and using classroom activities techniques	2.54±1.6	3 (0-5)	Student Support and Guidance
37	Developing and grading written assignments and projects	2.51±1.8	2 (0-5)	Teaching Environment
38	Team teaching	2.46±1.6	2 (0-5)	Teaching and Learning Methods
39	Writing effective objective tests	2.45±1.7	2 (0-5)	Teaching Environment
40	Teaching and supporting adult learners	2.43±1.5	3 (0-5)	Student Support and Guidance
41	Writing effective essay exams	2.41±1.7	2 (0-5)	Teaching Environment

Table D2: Descriptive statistics for faculty needs sorted (cont.)

Rank		Needs		Category
		Mean±SD*	Median (Min-Max)*	
42	Using and evaluating portfolios and e-portfolios	2.25±1.7	2 (0-5)	Assessment
43	Developing and grading laboratory assignments	2.04±1.8	2 (0-5)	Assessment

Table D3: Differences of highest and lowest needs with respect to gender

Needs category	Female*	Male*	*p*
A. Curriculum			
FNATAL05**	2.67±1.6 [3 (0-5)]	3.07±1.6 [3 (0-5)]	0.079
FNATAL04***	2.43±1.6 [2 (0-5)]	2.81±1.6 [3 (0-5)]	0.102
B. Teaching and Learning Methods			
FNATAL12**	2.91±1.6 [3 (0-5)]	3.18±1.7 [4 (0-5)]	0.178
FNATAL11***	2.33±1.7 [2 (0-5)]	2.52±1.6 [3 (0-5)]	0.407
C. Instructional Technology			
FNATAL18**	2.97±1.8 [3 (0-5)]	2.96±1.8 [3 (0-5)]	0.990
FNATAL21***	2.64±1.6 [3 (0-5)]	2.56±1.7 [3 (0-5)]	0.692
D. Teaching Environment			
FNATAL25**	2.80±1.7 [3 (0-5)]	3.16±1.7 [3 (0-5)]	0.127
FNATAL32***	2.32±1.8 [2 (0-5)]	2.50±1.7 [3 (0-5)]	0.443
E. Assessment			
FNATAL37**	2.31±1.7 [2 (0-5)]	2.71±1.6 [3 (0-5)]	0.082
FNATAL35***	1.73±1.8 [1 (0-5)]	2.26±1.8 [2 (0-5)]	0.039
F. Student Support and Guidance			
FNATAL43**	3.24±1.6 [4 (0-5)]	3.10±1.7 [3 (0-5)]	0.626
FNATAL40***	2.19±1.5 [2 (0-5)]	2.66±1.5 [3 (0-5)]	0.026

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)];
:most needed; *:less needed

Table D4: Differences of highest and lowest needs with respect to academic position

Needs category	Professor*	Associate Professor*	Assistant Professor*	Instructor/ Lecturer*	*p*
A. Curriculum					
FNATAL05**	2.69±1.8 [2.5 (0-5)]	2.61±1.7 [2.5 (0-5)]	2.69±1.6 [3 (0-5)]	3.26±1.5 [4 (0-5)]	0.089
FNATAL04***	2.73±1.7 [3 (0-5)]	2.56±1.7 [2 (0-5)]	2.57±1.6 [3 (0-5)]	2.65±1.6 [3.5 (0-5)]	0.915
B. Teaching and learning methods					
FNATAL12**	2.96±1.8 [3 (0-5)]	2.74±1.6 [2 (0-5)]	3.11±1.7 [4 (0-5)]	3.22±1.6 [3.5 (0-5)]	0.536
FNATAL11***	2.11±1.6 [2 (0-5)]	2.43±1.7 [2 (0-5)]	2.25±1.6 [2 (0-5)]	2.79±1.7 [3 (0-5)]	0.143
C. Instructional Technology					
FNATAL18**	2.69±2.0 [2 (0-5)]	3.06±1.9 [4 (0-5)]	2.80±1.8 [3 (0-5)]	3.15±1.7 [4 (0-5)]	0.559
FNATAL21***	2.07±1.8 [2 (0-5)]	2.81±1.6 [3 (0-5)]	2.32±1.7 [2 (0-5)]	2.88±1.6 [3 (0-5)]	0.063

Table D4: Differences of highest and lowest needs with respect to academic position (cont.)

Needs category	Professor*	Associate Professor*	Assistant Professor*	Instructor/ Lecturer*	*p*
D. Teaching Environment					
FNATAL25**	2.48±1.7 [2 (0-5)]	2.86±1.6 [3 (0-5)]	2.85±1.7 [3 (0-5)]	3.30±1.7 [4 (0-5)]	0.120
FNATAL32***	2.15±1.8 [2 (0-5)]	2.17±1.6 [2 (0-5)]	2.28±1.8 [2 (0-5)]	2.70±1.8 [3 (0-5)]	0.306
E. Assessment					
FNATAL37**	2.33±1.5 [2 (0-5)]	2.22±1.8 [2 (0-5)]	2.28±1.7 [2 (0-5)]	2.99±1.6 [3 (0-5)]	0.025
FNATAL35***	1.96±1.9 [1.5 (0-5)]	1.54±1.5 [1 (0-5)]	1.73±1.8 [1 (0-5)]	2.52±1.9 [3 (0-5)]	0.020
F. Student Support and Guidance					
FNATAL43**	2.81±1.8 [3 (0-5)]	2.92±1.7 [3 (0-5)]	2.95±1.8 [3 (0-5)]	3.54±1.6 [4 (0-5)]	0.077
FNATAL40***	2.35±1.5 [2.5 (0-5)]	2.21±1.7 [2 (0-5)]	2.39±1.5 [2 (0-5)]	2.62±1.5 [3 (0-5)]	0.559

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)]; **:most needed; ***:less needed

Table D5: Differences of highest and lowest needs with respect to field of study (A-E)

Needs category	Architecture*	Business & Economics*	Communication & Media*	Computing & Technology	Engineering*
A. Curriculum					
FNATAL05**	3.17±1.7 [4 (0-5)]	3.00±1.7 [3 (0-5)]	3.14±1.6 [3 (0-5)]	3.29±1.6 [4 (0-5)]	2.97±1.7 [3 (0-5)]
FNATAL04***	3.27±1.8 [3 (0-5)]	2.89±1.5 [3 (1-5)]	3.00±1.8 [3 (0-5)]	3.00±1.7 [3 (0-5)]	2.86±1.6 [3 (0-5)]
B. Teaching and learning methods					
FNATAL12**	3.17±1.6 [3 (1-5)]	3.05±1.6 [2 (1-5)]	3.45±1.8 [4 (0-5)]	3.62±1.3 [4 (1-5)]	3.35±1.5 [4 (0-5)]
FNATAL11***	2.67±2.1 [2.5 (0-5)]	2.47±1.7 [2 (0-5)]	2.67±1.6 [3 (0-5)]	2.95±1.5 [3 (1-5)]	2.75±1.5 [3 (0-5)]

Table D5: Differences of highest and lowest needs with respect to field of study (A-E) (cont.)

Needs category	Architecture*	Business & Economics*	Communication & Media*	Computing & Technology	Engineering*
C. Instructional Technology					
FNATAL18**	3.92±1.2 [4 (1-5)]	2.67±2.0 [2.5 (0-5)]	3.00±1.7 [3 (0-5)]	3.19±1.9 [4 (0-5)]	2.70±1.9 [3 (0-5)]
FNATAL21***	3.25±1.7 [4 (0-5)]	2.47±2.0 [3 (0-5)]	2.90±1.8 [3 (0-5)]	2.57±1.4 [3 (0-5)]	2.27±1.4 [2 (0-5)]
D. Classroom Management Techniques					
FNATAL25**	3.08±2.1 [4 (0-5)]	2.89±1.8 [3 (0-5)]	3.23±1.7 [4 (0-5)]	3.67±1.5 [4 (1-5)]	2.97±1.7 [3 (0-5)]
FNATAL32***	3.00±2.0 [3.5 (0-5)]	2.63±1.6 [3 (0-5)]	2.82±1.9 [3 (0-5)]	2.76±1.7 [3 (0-5)]	2.19±1.5 [2 (0-5)]

Table D5: Differences of highest and lowest needs with respect to field of study (A-E) (cont.)

Needs category	Architecture*	Business & Economics*	Communication & Media*	Computing & Technology	Engineering*
E. Assessment					
FNATAL37**	2.92±1.7 [3 (0-5)]	2.32±1.8 [2 (0-5)]	2.64±2.0 [3 (0-5)]	3.24±1.3 [3 (1-5)]	2.51±1.5 [2 (0-5)]
FNATAL35***	2.18±2.1 [1 (0-5)]	1.84±1.7 [2 (0-5)]	2.18±2.0 [1.5 (0-5)]	3.19±1.6 [4 (0-5)]	2.41±1.7 [2 (0-5)]
F. Student Support and Guidance					
FNATAL43**	3.67±1.4 [4 (1-5)]	2.84±1.6 [3 (0-5)]	3.41±1.6 [4 (0-5)]	3.95±1.3 [5 (1-5)]	3.24±1.6 [3 (0-5)]
FNATAL40***	2.18±1.5 [3 (0-5)]	2.68±1.5 [3 (0-5)]	2.71±1.8 [3 (0-5)]	2.86±1.2 [3 (1-5)]	2.57±1.4 [3 (0-5)]

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)]; **:most needed; ***:less needed

Table D5: Differences of highest and lowest needs with respect to field of study (H-T) (cont.)

Needs category	Humanities*	Physical & Natural Sciences*	Social & Behavioral Sciences*	Teacher Education*	Tourism & Hospitality*	*p*
A. Curriculum						
FNATAL05**	2.45±1.6 [2 (0-5)]	2.29±1.7 [3 (0-5)]	2.29±1.7 [3 (0-5)]	2.69±1.8 [3 (0-5)]	2.67±0.8 [3.5 (3-5)]	0.595
FNATAL04***	2.45±1.8 [3 (0-5)]	1.94±1.5 [2 (0-5)]	3.00±1.7 [3 (0-5)]	2.23±1.5 [2 (0-5)]	3.00±1.4 [2.5 (1-5)]	0.281
B. Teaching and learning methods						
FNATAL12**	2.91±1.8 [3 (1-5)]	2.53±1.7 [2 (0-5)]	3.05±1.8 [4 (0-5)]	2.45±1.7 [3 (0-5)]	3.00±1.7 [2.5 (1-5)]	0.330
FNATAL11***	2.73±1.6 [3 (0-5)]	2.00±1.4 [2 (0-4)]	1.79±1.7 [1 (0-5)]	2.32±1.9 [2 (0-5)]	1.83±1.3 [1.5 (0-4)]	0.269

Table D5: Differences of highest and lowest needs with respect to field of study (H-T) (cont.)

Needs category	Humanities*	Physical & Natural Sciences*	Social & Behavioral Sciences*	Teacher Education*	Tourism & Hospitality*	p
C. Instructional Technology						
FNATAL18**	3.30±1.5 [4 (0-5)]	2.06±1.6 [2 (0-4)]	2.61±1.9 [3 (0-5)]	3.41±1.8 [4 (0-5)]	3.50±1.6 [4 (0-5)]	0.245
FNATAL21***	2.55±2.1 [3 (0-5)]	1.65±1.2 [2 (0-4)]	2.00±1.7 [2 (0-5)]	3.31±1.5 [3 (0-5)]	2.75±2.0 [3 (0-5)]	0.051
D. Teaching Environment						
FNATAL25**	2.36±1.5 [2 (0-5)]	2.53±1.8 [3 (0-5)]	2.74±1.8 [3 (0-5)]	3.06±1.7 [3 (0-5)]	2.92±1.2 [3 (1-5)]	0.612
FNATAL32***	2.18±2.0 [2 (0-5)]	1.88±1.8 [1 (0-5)]	2.58±1.9 [3 (0-5)]	2.06±1.9 [1 (0-5)]	2.08±1.6 [2 (0-5)]	0.532

Table D5: Differences of highest and lowest needs with respect to field of study (H-T) (cont.)

Needs category	Humanities*	Physical & Natural Sciences*	Social & Behavioral Sciences*	Teacher Education*	Tourism & Hospitality*	*p*
E. Assessment						
FNATAL37**	2.45±1.6 [2 (0-5)]	2.18±1.6 [2 (0-5)]	2.53±1.7 [2 (0-5)]	2.29±1.8 [3 (0-5)]	2.58±1.6 [2.5 (0-5)]	0.595
FNATAL35***	1.40±1.6 [1 (0-4)]	1.47±1.8 [1 (0-5)]	2.21±2.0 [2 (0-5)]	1.55±1.7 [1 (0-5)]	2.55±1.9 [3 (0-5)]	0.011
F. Student Support and Guidance						
FNATAL43**	2.91±1.6 [3 (0-5)]	2.82±1.8 [3 (0-5)]	3.11±2.1 [3 (0-5)]	2.66±2.0 [2.5 (0-5)]	3.42±1.5 [4 (1-5)]	0.438
FNATAL40***	2.18±1.3 [2 (0-4)]	2.19±1.5 [2.5 (0-4)]	2.61±1.8 [3 (0-5)]	2.00±1.8 [1.5 (0-5)]	2.09±1.4 [2 (0-4)]	0.541

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)]; **:most needed; ***:less needed

Table D6: Differences of highest and lowest needs with respect to academic unit (A-C)

Needs category	Architecture*	Arts & Sciences*	Business & Economics*	Communication & Media*	Computing & Technology*
A. Curriculum					
FNATAL05**	3.31±1.8 [4 (0-5)]	2.29±1.5 [2 (0-5)]	3.05±1.6 [3 (0-5)]	3.26±1.5 [3 (0-5)]	3.21±1.5 [4 (0-5)]
FNATAL04***	3.33±1.7 [4 (0-5)]	2.12±1.6 [2 (0-5)]	2.85±1.5 [2.5 (1-5)]	3.35±1.6 [3 (0-5)]	3.07±1.6 [3 (0-5)]
B. Teaching and learning methods					
FNATAL12**	3.23±1.5 [3 (1-5)]	2.85±1.8 [3 (0-5)]	2.90±1.7 [2 (0-5)]	3.63±1.7 [4 (0-5)]	3.62±1.4 [4 (1-5)]
FNATAL11***	2.85±2.2 [4 (0-5)]	2.09±1.5 [2 (0-5)]	2.38±1.7 [3 (0-5)]	2.61±1.4 [3 (0-5)]	2.97±1.4 [3 (1-5)]

Table D6: Differences of highest and lowest needs with respect to academic unit (A-C) (cont.)

Needs category	Architecture*	Arts & Sciences*	Business & Economics*	Communication & Media*	Computing & Technology*
C. Instructional Technology					
FNATAL18**	3.85±1.1 [4 (1-5)]	2.33±1.7 [2 (0-5)]	3.05±1.8 [4 (0-5)]	3.00±1.6 [3 (0-5)]	3.00±1.9 [4 (0-5)]
FNATAL21***	3.23±1.6 [4 (0-5)]	1.97±1.6 [2 (0-5)]	2.57±1.8 [3 (0-5)]	2.89±1.7 [2.5 (0-5)]	2.38±1.5 [3 (0-5)]
D. Teaching Environment					
FNATAL25**	3.23±2.1 [4 (0-5)]	2.66±1.8 [3 (0-5)]	3.00±1.6 [3 (0-5)]	3.26±1.6 [4 (0-5)]	3.45±1.8 [4 (0-5)]
FNATAL32***	3.00±1.9 [3 (0-5)]	2.09±1.8 [2 (0-5)]	2.43±1.6 [2 (0-5)]	2.84±1.9 [3 (0-5)]	2.81±1.5 [3 (0-5)]

Table D6: Differences of highest and lowest needs with respect to academic unit (A-C) (cont.)

Needs category	Architecture*	Arts & Sciences*	Business & Economics*	Communication & Media*	Computing & Technology*
E. Assessment					
FNATAL37**	3.00±1.7 [3 (0-5)]	2.43±1.6 [3 (0-5)]	2.43±1.8 [2 (0-5)]	2.63±2.0 [3 (0-5)]	3.07±1.4 [3 (0-5)]
FNATAL35***	2.17±2.0 [1.5 (0-5)]	1.53±1.7 [1 (0-5)]	1.80±1.9 [1.5 (0-5)]	2.05±2.0 [1 (0-5)]	2.97±1.8 [4 (0-5)]
F. Student Support and Guidance					
FNATAL43**	3.77±1.4 [4 (1-5)]	2.94±1.8 [3 (0-5)]	3.00±1.6 [3 (0-5)]	3.47±1.5 [4 (1-5)]	3.72±1.5 [4 (0-5)]
FNATAL40***	2.42±1.6 [3 (0-5)]	2.21±1.5 [2.5 (0-5)]	2.85±1.3 [3 (0-5)]	2.72±1.8 [2.5 (0-5)]	2.83±1.3 [3 (0-5)]

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)]; **:most needed; ***:less needed

Table D6: Differences of highest and lowest needs with respect to academic unit (E-T) (cont.)

Needs category	Education*	Engineering*	Law*	Tourism & Hospitality Management*	p
A. Curriculum					
FNATAL05**	2.85±1.9 [3 (0-5)]	2.75±1.7 [2.5 (0-5)]	3.20±2.2 [4 (0-5)]	3.36±1.1 [3 (1-5)]	0.360
FNATAL04***	2.27±1.7 [2 (0-5)]	2.59±1.6 [3 (0-5)]	3.00±2.1 [3 (0-5)]	2.67±1.6 [2 (0-5)]	0.126
B. Teaching and learning methods					
FNATAL12**	2.74±1.8 [3 (0-5)]	3.13±1.5 [3 (0-5)]	3.20±2.0 [4 (1-5)]	2.71±1.7 [2 (1-5)]	0.460
FNATAL11***	2.63±1.9 [3 (0-5)]	2.50±1.5 [2 (0-5)]	1.60±2.1 [1 (0-5)]	1.79±1.4 [1.5 (0-4)]	0.317

Table D6: Differences of highest and lowest needs with respect to academic unit (E-T) (cont.)

Needs category	Education*	Engineering*	Law*	Tourism & Hospitality Management*	*p*
C. Instructional Technology					
FNATAL18**	3.33±1.7 [4 (0-5)]	2.55±1.9 [2 (0-5)]	2.80±2.2 [2 (0-5)]	3.36±1.6 [4 (0-5)]	0.219
FNATAL21***	3.13±1.5 [3 (0-5)]	2.31±1.5 [2 (0-5)]	2.20±2.6 [1 (0-5)]	2.79±1.8 [3 (0-5)]	0.116
D. Teaching Environment					
FNATAL25**	3.08±1.7 [3 (0-5)]	2.69±1.6 [3 (0-5)]	3.00±2.0 [3 (1-5)]	2.64±1.3 [3 (1-5)]	0.726
FNATAL37***	2.31±2.0 [2 (0-5)]	1.97±1.5 [2 (0-5)]	3.20±2.5 [5 (0-5)]	2.14±1.5 [2.5 (0-5)]	0.326

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)]; **:most needed; ***:less needed

Table D6: Differences of highest and lowest needs with respect to academic unit (E-T) (cont.)

Needs category	Education*	Engineering*	Law*	Tourism & Hospitality Management*	*p*
E. Assessment					
FNATAL37**	2.32±1.8 [2 (0-5)]	2.28±1.4 [2 (0-5)]	3.20±1.8 [3 (1-5)]	2.50±1.5 [2 (0-5)]	0.610
FNATAL35***	1.92±1.8 [2 (0-5)]	2.24±1.6 [2 (0-5)]	0.00±0.0 [0 (0-0)]	2.23±1.9 [2 (0-5)]	0.034
F. Student Support and Guidance					
FNATAL43**	2.87±2.0 [3 (0-5)]	3.07±1.6 [3 (0-5)]	2.60±2.5 [3 (0-5)]	3.21±1.5 [4 (1-5)]	0.373
FNATAL40***	2.28±1.8 [2 (0-5)]	2.28±1.3 [2 (0-5)]	2.60±2.3 [2 (0-5)]	2.00±1.4 [2 (0-4)]	0.693

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)]; **:most needed; ***:less needed

Table D7: Differences of highest and lowest needs with respect to teaching experience

Needs category	1-7 years*	8-14 years*	15-21 years*	Over 21 years*	p
A. Curriculum					
FNATAL05**	2.95±1.7 [3 (0-5)]	3.09±1.6 [3 (0-5)]	3.11±1.3 [3 (0-5)]	2.50±1.9 [2.5 (0-5)]	0.178
FNATAL04***	2.58±1.7 [2 (0-5)]	2.80±1.6 [3 (0-5)]	2.77±1.5 [3 (0-5)]	2.48±1.9 [3 (0-5)]	0.726
B. Teaching and learning methods					
FNATAL12**	2.70±1.5 [3 (0-5)]	3.25±1.6 [4 (0-5)]	3.36±1.6 [4 (0-5)]	2.82±1.9 [3 (0-5)]	0.132
FNATAL11***	2.80±1.5 [3 (0-5)]	2.39±1.6 [2 (0-5)]	2.64±1.7 [2.5 (0-5)]	2.12±1.7 [2 (0-5)]	0.191

Table D7: Differences of highest and lowest needs with respect to teaching experience (cont.)

Needs category	1-7 years*	8-14 years*	15-21 years*	Over 21 years*	p
C. Instructional Technology					
FNATAL18**	2.36±1.8 [2 (0-5)]	3.19±1.6 [4 (0-5)]	3.18±1.9 [4 (0-5)]	3.04±1.7 [3 (0-5)]	0.096
FNATAL21***	2.45±1.6 [3 (0-5)]	2.65±1.7 [3 (0-5)]	2.82±1.7 [3 (0-5)]	2.41±1.7 [2.5 (0-5)]	0.559
D. Classroom Management Techniques					
FNATAL25**	2.68±1.7 [3 (0-5)]	3.13±1.6 [3 (0-5)]	3.34±1.5 [3.5 (0-5)]	2.65±1.9 [3 (0-5)]	0.134
FNATAL32***	2.40±1.6 [2 (0-5)]	2.26±1.7 [2 (0-5)]	2.84±1.7 [3 (0-5)]	2.11±1.9 [1.5 (0-5)]	0.146

Table D7: Differences of highest and lowest needs with respect to teaching experience (cont.)

Needs category	1-7 years*	8-14 years*	15-21 years*	Over 21 years*	p
E. Assessment					
FNATAL37**	2.65±1.5 [3 (0-5)]	2.64±1.6 [2 (0-5)]	2.64±1.7 [3 (0-5)]	2.35±1.8 [3 (0-5)]	0.728
FNATAL35***	1.92±1.9 [1 (0-5)]	2.05±1.7 [2 (0-5)]	2.51±1.9 [3 (0-5)]	1.68±1.9 [1 (0-5)]	0.124
F. Student Support and Guidance					
FNATAL43**	3.05±1.7 [3 (0-5)]	3.38±1.5 [3.5 (0-5)]	3.64±1.7 [4 (0-5)]	2.56±1.8 [3 (0-5)]	0.005
FNATAL40***	2.38±1.4 [2 (0-5)]	2.38±1.5 [2 (0-5)]	2.90±1.6 [3 (0-5)]	2.09±1.7 [2 (0-5)]	0.055

*: Values in each cell represent mean±standard deviation [median (minimum-maximum)]; **:most needed; ***:less needed

Appendix E: Correlations

Table E1: Correlation between needs and FBITAL Factor 1 belief scores

Enthusiastic beliefs		N	Correlation Coefficient	Sig. (2-tailed)
	Curriculum			
FNATAL04***	Modifying curriculum	195	0.190**	0.008
FNATAL05****	Evaluating the curriculum	205	0.226**	0.001
	Teaching and Learning Methods			
FNATAL11***	Team teaching	204	0.221**	0.002
FNATAL12****	Developing higher order skills in students	205	0.287**	0.000
	Instructional Technology			
FNATAL18***	Developing a course web site	203	0.210**	0.003
FNATAL21****	Using mobile technology for learning	205	0.235**	0.001
	Teaching Environment			
FNATAL25***	Preparing effective teaching materials	206	0.271**	0.000
FNATAL32****	Writing effective essay exams	205	0.188**	0.007
	Assessment			
FNATAL35***	Developing and grading laboratory assignments	199	0.194**	0.006
FNATAL37****	Using research techniques to develop classroom instruction	205	0.199**	0.004
	Student Support and Guidance			
FNATAL40	Teaching and supporting adult learners	201	0.256**	0.000
FNATAL43	Supporting students with disabilities	206	0.233**	0.001

*:p < .05; **:p < .01; ***:most needed; ****:less needed

Table E2: Correlation between needs and FBITAL Factor 2 belief scores

Apathetic beliefs		N	Correlation Coefficient	Sig. (2-tailed)
	Curriculum			
FNATAL04***	Modifying curriculum	195	-0.104	0.148
FNATAL05****	Evaluating the curriculum	205	-0.130	0.062
	Teaching and Learning Methods			
FNATAL11***	Team teaching	204	-0.109	0.119
FNATAL12****	Developing higher order skills in students	205	-0.157*	0.025
	Instructional Technology			
FNATAL18***	Developing a course web site	203	-0.141*	0.045
FNATAL21****	Using mobile technology for learning	205	-0.183**	0.009
	Teaching Environment			
FNATAL25***	Preparing effective teaching materials	206	-0.132	0.059
FNATAL32****	Writing effective essay exams	206	-0.125	0.075
	Assessment			
FNATAL35***	Developing and grading laboratory assignments	199	-0.062	0.381
FNATAL37****	Using research techniques to develop classroom instruction	205	-0.067	0.337
	Student Support and Guidance			
FNATAL40***	Teaching and supporting adult learners	201	-0.111	0.117
FNATAL43****	Supporting students with disabilities	206	-0.148*	0.034

*:p < .05; **:p < .01; ***:most needed; ****:less needed

Table E3: Correlation between needs and FBIICT Factor 1 belief scores

Apathetic beliefs		N	Correlation Coefficient	Sig. (2-tailed)
	Curriculum			
FNATAL04***	Modifying curriculum	195	0.124	0.085
FNATAL05****	Evaluating the curriculum	206	0.160*	0.022
	Teaching and Learning Methods			
FNATAL11***	Team teaching	205	0.272**	0.000
FNATAL12****	Developing higher order skills in students	206	0.191**	0.006
	Instructional Technology			
FNATAL18***	Developing a course web site	204	0.166*	0.018
FNATAL21****	Using mobile technology for learning	206	0.225**	0.001
	Teaching Environment			
FNATAL25***	Preparing effective teaching materials	207	0.145*	0.037
FNATAL32****	Writing effective essay exams	206	0.206**	0.003
	Assessment			
FNATAL35***	Developing and grading laboratory assignments	200	0.157*	0.027
FNATAL37****	Using research techniques to develop classroom instruction	206	0.185**	0.008
	Student Support and Guidance			
FNATAL40***	Teaching and supporting adult learners	202	0.134	0.058
FNATAL43****	Supporting students with disabilities	207	0.138*	0.047

*:p < .05; **:p < .01; ***:most needed; ****:less needed

Table E4: Correlation between needs and FBIICT Factor 2 belief scores

Apathetic beliefs		N	Correlation Coefficient	Sig. (2-tailed)
	Curriculum			
FNATAL04***	Modifying curriculum	195	0.370	0.607
FNATAL05****	Evaluating the curriculum	206	0.009	0.206
	Teaching and Learning Methods			
FNATAL11***	Team teaching	205	-0.115	0.101
FNATAL12****	Developing higher order skills in students	206	-0.057	0.413
	Instructional Technology			
FNATAL18***	Developing a course web site	204	-0.019	0.792
FNATAL21****	Using mobile technology for learning	206	-0.148*	0.034
	Teaching Environment			
FNATAL25***	Preparing effective teaching materials	207	-0.119	0.087
FNATAL32****	Writing effective essay exams	206	-0.068	0.330
	Assessment			
FNATAL35***	Developing and grading laboratory assignments	200	-0.046	0.520
FNATAL37****	Using research techniques to develop classroom instruction	206	-0.009	0.899
	Student Support and Guidance			
FNATAL40	Teaching and supporting adult learners	202	-0.167*	0.018
FNATAL43	Supporting students with disabilities	207	-0.180**	0.010

*:p < .05; **:p < .01; ***:most needed; ****:less needed