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A Gateway to Integration: a Study of American Families and their International Visitors

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Abstract

Research shows that helping international students build support networks by forming new friendships is crucial to counteracting the feelings of isolation, loneliness, and frustration that may arise from studying abroad. Studies have shown that friendships between international students and host nationals benefit the local community rather than just the university by promoting intercultural communication and understanding. Most of these studies, however, have only focused on the friendships between international and domestic students and not between international students and local American or “friendship families.” This study aims to make a contribution to the existing scholarship on intercultural friendship by looking at the expectations and obstacles that structure relationships between friendship families and international students at a research-one public land grant institution. By pinpointing these factors, we hope to take the first steps in developing a set of best practices for ensuring successful intercultural interactions between international students and their friendship families.

Keywords: Integration, studying abroad, international students, intercultural friendship

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Introduction to Friendship Family Programs in the United States

By and large, international student populations at major universities can be very diverse with respect to racial identity, physical appearance, religious and political beliefs, and socioeconomic status. That is, “international sojourners” at U.S. universities are very different individuals, yet, as cross-cultural scholars assert, foreign students are often stereotyped by their American classmates, faculty, administrators, and even by community members (Spencer-Rodgers, 2001, p. 640). Some of the most pervasive stereotypes include viewing these students as “handicapped, deficient or bewildered” and “as lacking the English language ability, academic . . . preparation and familiarity of the U.S. educational system (Paige, 1990, p. 47). International students may experience adjustment difficulties and “language and cultural barriers between internationals . . . and host nationals can lead to interaction difficulties” and to the perception that international students can be withdrawn or socially isolated (Spence-Rodgers, 2001, p. 641).

Programs that connect international students at U.S. universities with local families or community members can alleviate some of these negative effects by offering “an important, informative experience that helps students adapt to unfamiliar U.S., local and academic cultures” (Andrade, 2009, p. 198). In addition, American families benefit from experiencing another culture often times without leaving the city limits. It is a widely held belief that the social and cultural integration of international students promotes persistence (Spence-Rodgers & McGovern, 2002). Given the revenue spent to attract international students to American universities, it is worth considering how to retain students. Integration through a friendship family program can be one component of that integration that may ultimately lead to greater return on investment. In the United States, it is common for universities and colleges to have a hospitality program, which may or may not include a host family or friendship family program (NAFSA, 2014).

One such program, The Missoula International Friendship Program, aims to help students to adjust to a new culture by providing “opportunities for social and cultural interaction among Missoula community members, international students and international scholars by sponsoring activities and gatherings throughout the year” (Fluck, 2009, p. 194). Like this and other friendship family programs, the program at the university where this research was conducted provides an alternative to traditional host family programs by creating opportunities for international students and scholars to develop relationships with local families and community members on a volunteer basis without living together. To help ensure successful intercultural interactions, these programs also strive to design and implement programming that encourages international students and community members to participate in activities specifically designed to expose both parties to different cultures, thus promoting discussion about cultural differences and similarities.

International students who have the opportunity to participate in a friendship family program may be better able to adjust to the sociocultural expectations and obstacles of life in America. Ultimately, connecting students to a community beyond the university may help institutions of higher education retain their international students and improve students’ acculturation process.

Literature Review

Obstacles and Expectations

International college students that come to the U.S. to study may face various stressors in their daily lives (Chen, 1999; Hayes & Lin, 1994). Social isolation or loneliness may begin when international students start facing the challenges of living abroad, such as heavy academic workloads, English-language barriers, unfamiliar immigration procedures, adjustment issues, or prejudice and hostility to name a few (Chen, 1999; Gareis, Merkin, & Goldman, 2011; Zhai, 2002). When confronted with these challenges, many students retreat into their own language communities or decide to further isolate themselves (Chen, 1999). As studies have shown, students who take this path often find themselves experiencing even more language and interaction difficulties; they enter a “vicious circle” that can often lead them to perform poorly in school or abandon their studies altogether (Gareis, 1995, p. 48).

Researchers agree that one of the best ways to ensure international student retention is to encourage them to form intercultural friendships with host nationals. While interactions with other students from their home country remain an important source of support for international sojourners, studies show that international sojourners benefit most from intercultural rather than monocultural relationships (Gareis, 1995; Hendrickson, Rosen, & Aune, 2011; Prieto, 1995). Gareis et al. (2011) argue, in fact, that these types of friendships increase “students’ general sojourn satisfaction, academic success, and intercultural as well as foreign-language growth” (p. 154). Establishing intercultural friendships is not, however, an easy process. International students’ often find making American friends stressful and challenging (Williams & Johnson, 2011) or express disappointment with the quality of these relationships (Gareis, 1995). These findings indicate, then, that international students do not only face multiple obstacles when it comes to adjusting to their new environments, but also specific difficulties when attempting to create new friendships. In their study, Hayes & Lin (1994) identify language difficulties, cultural aspects, personal characteristics, academic concerns, and perceived discrimination as factors that might inhibit the formation of intercultural friendships. In her exhaustive analysis on how intercultural friendships are formed, Gareis (1995) identifies twelve key factors that influence friendship formation between international students and host nationals: “culture, personality, self-esteem, friendship elements, expectations, adjustment stage, cultural knowledge, communicative competence, external variables, proximity, U.S. elements, and what we may call chemistry” (pp. 48-49). While not all of these factors necessarily act as obstacles, they should be considered when trying to address the degree of success of intercultural friendship formation processes.

Out of all the factors listed above, international students’ expectations when approaching international friendships is perhaps the least studied. To our knowledge, only Gareis’ 1995 study has addressed this issue. She argues that students’ expectations usually relate to their motivation, expected outcomes and developmental stages. Factors such as the reasons for studying abroad, the length of a student’s journey and personal elements such as marital status and maturity level can impact not only students’ success at developing intercultural friendships but also what they expect to gain from these interactions (p. 57).

Using Intercultural Friendship to Cope with Obstacles

Extensive research has also been conducted on the best practices to help international students navigate the challenges that they face when attempting to establish new friendships at an American university. For instance, having access to a student center that plans and hosts social events and designs programs to integrate international students with American students, the campus and the community has been shown to make a considerable impact in international student retention (Bista & Foster, 2011, pp. 6-7).

Although having access to programming and events helps students alleviate some of the stress that comes with adjusting to a new culture, research suggests that university-sponsored programming that puts students in touch with domestic students might not be enough. Williams & Johnson (2011) found low levels of interaction between international and domestic students at such events. They concluded that careful planning and encouraging faculty to make cross-cultural opportunities a requirement of their courses can help foster interactions (Williams & Johnson, 2011). Zhai (2002) states that universities should provide orientation programs for international students on academic and cultural differences as well as providing activities for international students to interact with domestic students. These activities could help to improve the international students' language as well as cultural adjustment. Even when events, programs and workshops are planned and facilitated by a university department, international students do not always take advantage of these opportunities. The question of how university staff can persist in their efforts to help international students adjust to their new environment remains unanswered.

It seems, then, that simply putting international students in touch with American students through events and programming is not enough to counteract international students' loss of social support and encourage them to build new social networks and develop a sense of belonging. Hendrickson et al.'s (2011) analysis has shown that building "more diverse friendship networks, particularly with host nationals" (p. 290) may have an overall positive effect on international students' satisfaction levels, academic performance and level of adjustment. The study conducted by Hendrickson et al. is part of an on-going effort to better understand the nature of intercultural friendships (Bochner, McLeod, & Lin, 1977; Gareis, 1995; Gareis, Merkin, & Goldman, 2011), how identity is negotiated in intercultural friendships (Hotta & Ting-Toomey, 2013; Lee, 2006), and the benefits to be gained from these unique relationships (Gareis, 1995; Furnham & Erdmann, 1995; Redmond & Bunyi, 1993; Searle & Ward, 1990; Ward & Masgoret, 2004). Most of these studies, however, focus on the friendships between international and domestic students or between international sojourners and host nationals rather than between international students and host community members specifically.

As this literature review has revealed, international students face various obstacles and barriers when they study abroad. Out of all the possible stressors students can experience, the loss of social support systems seems to be one of the most crucial ones. While forming friendships with host nationals within the university system can contribute to easing international students' feelings of isolation, rejection and communicative inadequacy, this review has also suggested that expanding these friendships to include host community members can help to alleviate some of these stressors and improve student retention. Since studies on the topic of friendships between international student and host national families are almost non-existent, this analysis seeks to make a contribution to the growing field of intercultural friendship by attempting to pinpoint

some of the most important obstacles that international students and host families face when attempting to engage in meaningful cross-cultural interactions. It also aims to outline the steps both parties take to manage each other's expectations and overcome obstacles in an attempt to begin to formulate a theory of best practices when it comes to establishing and managing friendship family programs.

Methodology and Research Questions

Our research focused on the expectations that international students and American families have of each other and on the obstacles that both populations face when attempting to engage in successful intercultural interactions. Data was collected through a self-administered survey through Qualtrics in the fall of 2014 at a research-one public land grant institution in a rural setting. Two separate surveys structured around a five-point Likert scale and open-ended questions were sent to 167 students and 62 families. Twenty-five international students and 16 families who were enrolled in a university-sponsored, friendship-family program responded to the survey.

Our research seeks to consider answers to the following three questions:

1. What expectations do international students have of their American "families"?
2. What expectations do American "families" have of their international student friends?
3. What obstacles do international students and American families face when attempting to engage in meaningful intercultural interactions?

For the purposes of this study, we define intercultural interactions as those which encourage one's "ability to communicate effectively and appropriately in intercultural situations based on one's intercultural knowledge, skills, and attitudes" (Deardorff, 2006, p. 247). Expectation with regard to communication is embedded within intercultural interactions. Expectation can be defined as one's degree of awareness to "cross-cultural and linguistic differences, world views, and beliefs and values" (Chamberlin, 2002, p. 1). At times, intercultural communication expectations can present obstacles or barriers to effective communication. It is important to understand that obstacles may arise from reluctance to communicate, distress or anxiety in the communicative situation and communication errors or misunderstandings (Tatsuki & Houck, 2010).

Results and Analysis

Population Profile

Students. Among the 25 students who responded to the survey, 52% of them are in the 18 to 27 age range. A majority of them are single, have no children and have been in the U.S. for one to three years, which may indicate that students are more likely to join a friendship family program once they feel more settled in the United States.

Less than half of all participants are graduate students. The rest of the studied student population included Intensive English Program students, undergraduate students and international scholars. The majority of respondents are engineering majors. The rest of the students are majoring in the social and natural sciences with a minority of respondents studying education, accounting and international business.

Families. Though previous international experience is not a requirement for family participants, the majority of respondents have had prior international experiences through travelling, living, working, or even volunteering abroad. The ages of respondents ranged from 25 to 75 years old. The majority are employed and three are retired. Nearly all respondents are married and over half reported that they have children. The countries they have traveled to spanned different regions, including Europe, South America, Africa, and Asia. Two family respondents reported hosting international students before. One respondent shared that they interacted with international students regularly through their job in the U.S.

Expectations

Students. An overwhelming majority of respondents, 23 out of 25, said the primary reason they joined the friendship family program was to interact with Americans. Improving their English was the second most common reason for joining the program, while teaching others about their own culture came in at a distant third. Once in the program, respondents expected to engage in activities or discussion that fostered cultural understanding and improved intercultural interaction. Students also listed improving their English language proficiency and engaging in friendly social interactions as expectations for the program, although these expectations seemed to be secondary to engaging in language and cultural sharing.

When asked about what potential friendship families might expect from them, students guessed that families might be interested in engaging in activities or discussions that fostered cultural understanding and asked the student to share details about their culture. Students also believed that families might expect them to engage in friendly social interactions and to participate in outdoor leisure activities.

Families. All family participants shared that they joined the program mainly to interact with international students. A minority of respondents also reported joining the program to either learn more about foreign cuisines or practice a foreign language. When asked about their expectations, families mentioned offering hospitality, mentoring, and cultural understanding to international students and scholars. One respondent shared that they wanted to introduce Mexican-American culture in addition to mainstream “American” culture. Like students, families also reported that they expected to partake in leisure activities with their students. Respondents felt that international students shared the same expectations as them, including an interest in improving cultural understanding and participating in leisure activities. Some families believed that students joined the program to improve their English communication skills and become further involved in the community.

Family and Student Interactions

For both students and families, sharing a meal was the most common way to spend time together. As students remarked,

The experience I like the most was the first dinner that I had in the family's house. It was very fun, I learned a lot and could show my culture.

I enjoyed going out on coffee with my American mom and her son. That was awesome, and a great bonding exercise. After that, we went to her brother's house for lunch, and that was fantastic.

One family noted that,

One of my best memories of our student from Germany was making pretzels together in the kitchen. I learned so much and it was so fun for my husband and me!

Leisure activities in addition to local outdoor activities were popular as well. Students preferred to engage in informal conversation with their families on a variety of topics including asking for advice. Families, on the other hand, listed social or community-based events such as taking their students to a 4th of July celebration, concerts, county fairs, and horse shows, as successful platforms to interact with students. Many families invited their students to experience holidays with them as well. In sum, students were primarily focused on communication and experiencing family life whereas families wanted to showcase local culture.

Obstacles and Responses to Obstacles

Both sets of respondents listed communication and scheduling as their main challenges in interacting. Sixty percent of families, for instance, shared that they met with their host student three to five times throughout the semester. These numbers tended to go down when students were asked to report how many times per semester they met with their families. In fact, roughly half of the students reported having met with their families zero to two times during the semester they began the program. Although the office of international programs at the studied university sponsors various events throughout the year to try to make it easier for families and students to get together, 40% of families and 55% of students said that they never attended any of these events.

While scheduling conflicts are the primary obstacle faced by both families and students, cultural differences and language barriers also created some challenges. At least five family respondents reported having some sort of cultural "misunderstanding" with their student friends, while only two listed miscommunication because of English language proficiency. Students, on the other hand, viewed language barriers as a significant obstacle, with at least five respondents citing communication or the need to improve their English as obstacles in their interaction with their family friends. Only one student cited cultural differences regarding politeness and humor as an obstacle.

Finally, issues also presented themselves before families even met with their students. For instance, some reported matching difficulties such as being matched too late or with too many students. Unlike families, a majority of students think that the family and student matching process occurred in a timely and appropriate manner.

When families and students encountered intercultural interaction difficulties, they deployed a range of interpersonal strategies to deal with these obstacles. Families, on the one hand, used communication, patience and understanding. One respondent reported using humor as their tool for resolving issues. A majority of students, on the other hand, simply listed “perseverance” as the best way to improve communication and language proficiency when interacting with their families.

Satisfaction with the Program and Outcomes

The university-sponsored friendship family program hopes to foster cultural understand and intercultural communication among its participants. Both students and families seem to perceive the outcomes of the program as achievable. A majority of students think that they learned valuable information about American culture from their family. This knowledge, in turn, seems to translate to an improved sense of belonging and a newfound confidence when interacting with people in their new country. Seventy percent of students, for instance, believe that their interactions with their family have helped them to feel comfortable interacting with American community members off-campus, and seventy-five percent of them feel even more comfortable with American community members on-campus. A majority of students also claim to interact at least once a week with Americans outside of the classroom and half of the students attend events and programming organized by the office of international programs at the studied university on a regular basis.

From a management and customer service standpoint, both groups of respondents reported their satisfaction with the program outcomes. Ninety-five percent of students, for example, think that communication with program staff was effectively and timely, while 76% of the students agree that events organized by the office of international programs at the university were well-organized, fun and scheduled at times when families and students were available. What’s more, 89% of students plan to participate in the program again in the future. In addition, 69% of families recommended the program to other families, which indicates that they believe that their experience with their international friends has been meaningful enough to merit sharing.

When families recommended the program to others, they shared that the best takeaways from this program are the friendships they were able to build and the cultural understanding they gained. As one respondent explained, “it’s worth the risk and can be very enjoyable and enlightening.” They viewed it as a readily available opportunity to learn about other cultures. Families expressed that, in addition to providing international students with a means to practice English, avoid loneliness and integrate into the community, the program was rewarding by sparking new friendships and providing cultural insight. While both families and students were able to appreciate the value of forming intercultural friendships and were generally satisfied with the program, they also felt that there was room for the program to improve.

Recommendations for Program Improvement

Students suggested having more purposeful activities, a larger pool of families as potential matches and activities that encourage community involvement. Please recall that families often socialized with their students through participation in various community events. This discrepancy may indicate that students don't perceive attending local celebrations as a way of engaging with the community.

Families suggested using targeted outreach for recruiting more families for this program. Proposed advertising methods included email, newspaper, internet, and radio, as well as publicity through presentations at university departmental meetings. One respondent advocated for providing an incentive for families to recruit new families. Program improvement in terms of having more facilitated or shared activities and inviting prospective families to meet current family participants and their students was also mentioned.

Research Questions 1 and 2

Let's begin with research questions one and two which ask us to consider the expectations international students have of their American families and vice versa. The most prominent expectation we found is that families and international students tend to believe that both parties have the same expectations for the program and interacting with one another. Intercultural understanding was a huge motivating factor for families and students to participate in the program.

As the results of the surveys show, families expected to share their own culture. They prioritized taking students to community events and teaching them about American culture and holidays. In contrast, students' primary expectation was to communicate with families and experience family life. This emphasis on communication for students and cultural sharing on the part of families signals the importance of forming strong relationships. This family interest in sharing culture suggests that, the program may be helping to create more "interculturally literate" families and students (Heyward, 2002) while, at the same time, putting support systems in place to help students adjust and communicate effectively (Lacina, 2002).

International students also have the expectation that their families will help them with their English and communication skills. As previous research on the perceived importance of English and academic study has shown, international students feel that improving their language proficiency is key to achieving academic success (Zhai, 2002). Therefore, it is not surprising that students listed practicing English as one of their main reasons for joining the program. The fact that, students reported that their interactions with their host family improved their sense of comfort in interacting with Americans suggests that friendship family programs may help alleviate second language anxiety international students have by providing them with a casual off-campus environment with which to practice their English and learn about American culture (Zhai, 2002). As one student testified, "the communication between me and my family was pretty awesome and it really help me think more confident about English and America."

Students' increased confidence in their English proficiency may also have to do with the fact that families share the expectation that students will want to practice their English and they

were open to helping students achieve this goal. Furthermore, the high number of students who decided to join the program while also enrolled in Intensive English classes may indicate that, from a student's perspective, taking English classes may not be enough to attain a high enough proficiency of English.

To better understand the pressure to learn English and why internationals join a friendship family program, we should consider the value of code-switching. Opportunities for practicing code switching outside of the academic setting on a small scale through informal meetings with a host family provides international students with more assurance in their ability to interact with American community members on a larger scale (Molinsky, 2007). For example, international students may have learned through their interactions with their American host to put less emphasis on the value of "saving face" from their home cultures which may have initially caused them to be anxious of interacting with Americans due to fear of embarrassment and shame through committing cultural faux pas and making English language mistakes. In addition, American hosts may mimic international students' family support systems back home which, as research shows, is a major source of security and identity for those from collective cultures (Lacina, 2002).

While students reported leaving the program having had their expectations regarding English proficiency and acculturation met, family participants also stated that the greatest program outcomes were their increased cultural understanding and viewed this as a convenient opportunity to increase their cross-cultural and intercultural knowledge. As our research shows, friendship family programs benefit both parties involved and results in "cultural synergy" (Kingston & Forland, 2008, p. 211). In other words, the intercultural communication and the literal and figural give and take occurring between families and international students in a friendship family program may be the perfect receipt to integrate and value all cultures. That is,

For international students, increased friendship with host nationals means more opportunities to learn about host culture and language, better social integration, greater sojourn satisfaction, and more positive views of the host country. For the host community, the benefits include exposure to other cultures, networking and travel opportunities for local students, and an enhanced international image abroad (Gareis et al., 2011, p. 168).

Research Question 3

Still, even with all of the positives of intercultural friendships, challenges may arise. Research question three allows us to consider what obstacles international students and their American families face when attempting to engage in meaningful intercultural interactions. With regard to this question, the primary challenge both families and students reported is scheduling. Scheduling presents a challenge for several reasons. Families and students may have different communication styles or prefer to communicate in different registers. Families may use e-mail to connect with students, but students do not always check e-mail. Punctuality may be another challenge as perceptions of time may differ as well.

Students reported overextending themselves and are very concerned about their academic performance and specifically their grades. Although international students see the value of experiencing American family life, they also clearly feel the pressure to succeed at the university

and this may be the top priority for many students leading them to push social integration or interaction with Americans to the bottom of their list of priorities. This may be due to pressure from home to perform or a window into implicit social and cultural differences that impact adjustment. Still, American families also face constraints when it comes to scheduling because of work schedules, children and other commitments. Given the scheduling and time constraints, it can be challenging for international students and American families to develop a strong bond.

In sum, relationship building in the U.S. could be considered fast-paced compared to that in other parts of the world. American communication builds upon this, as asking someone how they are or suggesting that they have dinner in the future is not always meant to be taken literally. This has led to the misconception by international students that Americans are friendly yet superficial and by Americans that international students are introverted and only want to socialize with students from their home country. As Williams and Johnson (2011) and Gareis et al. (2011) have shown, misconceptions such as the ones mentioned above constitute one of the most important obstacles to forming intercultural friendships.

Suggestions for Further Research

This research was limited by the context in which it was conducted and by the demographics of the respondents who participated in the program and thus the study. For instance, the majority of student respondents were undergraduate students, yet the total international enrollment at the studied university is nearly equal with regard to graduate and undergraduate international students. This offers an opportunity for future researchers to investigate international students who participate in a friendship family program to better understand their social and cultural experiences in the United States.

More specifically, it may be worth employing a mixed-methods or qualitative methodology to better understand how international students' interactions with friendship or host families in particular benefitted them and how those interactions impact their interactions with American students, staff and faculty. A qualitative methodology may enable a deeper understanding of the experiences of social integration or isolation that international students are having.

Finally, how can a university assist international students and their American families to overcome challenges with regard to interacting? Since families' and students' inability to attend university-sponsored events seems to suggest that more programming will not really make a difference in terms of helping families and students find the time to meet, more training to make students and families aware of the cultural differences regarding scheduling and punctuality might be what is needed to encourage students and families to communicate more openly and honestly about scheduling difficulties. In addition, reminding students of the importance of maintaining work-life balance through counseling outreaches may encourage graduate students, in particular, to find the time to meet with their family friends.

When dealing with language barriers and cultural misunderstandings, the university should follow the advice of respondents and provide orientations for students and events, programs and workshops that deal with social and cultural norms in a fun way or through medium such as cooking that all cultures can appreciate and enjoy. As families reported, humor,

patience and understanding go a long way in negotiating misunderstanding along the path to “cultural synergy” (Kingston & Forland, 2008).

Conclusion

In summary, we know that friendship family programs have tremendous potential to bring American families and students together. These university-sponsored programs are a testament to the importance of connecting students to the wider community. Still, friendship family programs at institutions of higher education in the United States are unusual. As Gareis, Merkin and Goldman (2011) conclude,

On an institutional level, more universities should offer events and programs to foster interaction, including socializing opportunities, buddy systems, and residential programs. (p. 167).

We also know that institutions of higher education typically aim to integrate international students into the university environment and the community so as to promote retention or a return on the investment for international student recruitment efforts. As such, it is worth exploring how effectively friendship family programs not only socially and culturally integrate students, but more specifically how they retain students.

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Integrated Teaching: Boon or a Bane?!

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Abstract

The objective of the present study was to evaluate the effectiveness of integrated teaching program using student feedback. A questionnaire to evaluate the effectiveness of the existing teaching program was prepared and distributed among 185 second year medical undergraduate students who underwent integrated teaching in their first year. Their responses were recorded, evaluated and analysed statistically. Additionally the performance of the students was also assessed by recording their year-wise results in the university examinations. This was further compared with the results of the students who were not exposed to integrated teaching in the past years and the findings were tabulated. Integrated teaching was found to be an innovative method in strengthening the teaching-learning process and received wide acceptance from the student population.

Keywords: *Integrated teaching, video demonstration, case presentation, conventional teaching, didactic lectures*

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Introduction

The pre-clinical subjects like Anatomy, Physiology & Biochemistry are taught to MBBS students in their first year separately without much correlation to each other. Students may lose interest in the subject as it involves didactic lectures and evaluation based on pure recall rather than comprehension and analysis. It is essential to understand the importance of these subjects in their future curriculum and practice. The integration between the preclinical subjects is also essential to correlate the facts. Therefore, to bridge this gap between the subjects and to acquaint the students with clinical scenarios, integrated teaching is in practice.

Integrated teaching (IT) aims to cater to the students' needs and make the subjects clear and understandable. IT is involved in connecting skills and knowledge from multiple sources and experiences and applying skills in various settings. It therefore helps in bridging connections between academic knowledge and practicals (Huber & Hutchings, 2004).

Medical education mainly aims at producing medical professionals with good clinical competencies and community orientation with proficient communication skills. This becomes very important in the treatment of daunting health problems (Paul, 1993). Tremendous responsibility is vested on the institutions providing medical education to bring about required innovations in the existing system (The Edinburgh Declaration, 1988).

Majority of medical colleges in India follow the traditional curricula in teaching. This is disciplined based, teacher centered, and examination oriented. Such modules are under criticism for placing too much emphasis on memorization of facts and figures and for overloading the students with excessive details (Harden et al, 1984). As a result, students are unable to correlate the basis of clinical problems or cases and thus could face problems during the diagnosis and treatment of a patient (Dandannavar, 2010). Teachers should assume a new role of facilitating the process of active learning rather than overloading students with excessive details through a series of elaborate lecture and voluminous book. Thus a student centered approach helps to make learning a pleasure and subsequent use of knowledge in an effective manner in clinical practice (Lemos et al, 2014).

Methodology

Integrated teaching program in our institution

In our curriculum, IT programme has been implemented and effectively practised from the past four years. It involves video demonstrations of dissected specimens, guest lectures by the clinical faculty and case presentations by the students. This is practiced in addition to conventional teaching methods.

Description of IT methodologies practiced:

1. Case presentations:

A group of 25 students were given a case on a particular organ system which contained questions related to its anatomy, physiology and biochemical analysis. The students were given a month

time for preparation and it was presented by the members of the group. A panel of faculties was assigned to judge the same.

2. Lectures by clinicians:

Lecture sessions by clinicians were organized by Department of Anatomy once a month. The topics were chosen in such a way that they are correlated to the particular preclinical topic which is been taught.

3. Video demonstrations:

Demonstration of dissected specimens by the faculty members at the end of academic year was introduced as a novel method for revision of the subject. The presentations were recorded and were uploaded in the computers of student learning center such that the students could access the same whenever required.

The present study is therefore an attempt to document the effectiveness of IT.

Study Design

The present cross sectional study was carried out involving 185 second year MBBS students (93 males and 92 females) who underwent Integrated Teaching (IT) in their first year. The study was conducted in Kasturba Medical College, Manipal University, Manipal and was approved by the Institutional Ethics Committee, Kasturba Hospital, Manipal. The age group of the students ranged between 18 to 20 years. All the students were given an option to participate or to decline the participation in the study. An informed consent was taken from the students who agreed to participate. A questionnaire was therefore constructed as shown in table 1, to acquire the students' feedback regarding the benefits of integrated teaching and its impact on their learning abilities and was distributed to them in the beginning of the academic year 2014-15. The students were encouraged to give their effective feedback. The responses ranged from strongly disagree to strongly agree with a Likert scale of 1-5. The results were expressed in percentages and were tabulated.

Table 1: A model questionnaire denoting effectiveness of integrated teaching (IT) assessed.

S. No.	Aspects assessed
1	IT gives confidence in approaching clinical cases and evokes interest in studying pre-clinical subjects
2	IT helps to bridge the gap between academic knowledge and its application in daily practice
3	IT is better than didactic lectures
4	IT should be conducted twice a month or more
5	IT would help them in preparing for their examinations
6	IT in pre-clinical departments is beneficial and must be compulsorily incorporated in a regular teaching curriculum
7	View of better teaching technique a) Case presentation with discussion in small groups b) Seminars and brain storming session c) Video demonstration of clinical scenario followed by discussion d) Lecture by clinical faculty followed by discussion

Additionally the performance of the students was also assessed by recording their year-wise results in the university examinations. This was further compared with the results of the students who were not exposed to IT in the past years and the findings were tabulated. The results were expressed in the form of bar graphs and pie chart.

Results

IT has received tremendous positive response from the students. This also showed a positive impact on the examination results which had a progressive increase in the past three

years. The students who had passed out from the first year, when exposed to clinical scenarios, affirmed that integrated teaching programme was very helpful in confidently solving clinical cases and effectively correlating clinical with preclinical subjects thus arriving at an accurate diagnosis. This opinion was seconded even by the clinical faculty.

The students' responses to the questionnaire on IT revealed positive findings. 92.4% students agreed that IT gives confidence in approaching clinical cases and evokes interest in studying pre-clinical subjects (Graph 1: See the Appendix). 85.8% of students agreed that IT helps to bridge the gap between academic knowledge and its application in daily practice (Graph 2: See the Appendix). 73.4% stated that IT is better than didactic lectures (Graph 3: See the Appendix). 75% of the students agreed that IT should be conducted twice a month or more (Graph 4: See the Appendix).

But when asked, if IT would help them in preparing for their examinations, 55.1% students disagreed the same (Graph 5: See the Appendix).

Overall, 90.8% agreed that implementation of IT in pre-clinical departments is beneficial and must be compulsorily incorporated in a regular teaching curriculum (Graph 6: See the Appendix).

When the students were asked to give their preferences on IT techniques, majority of them found video demonstrations beneficial in learning and revising while the case presentations helped them to develop the skills in public speaking. Students also affirmed that case presentations helped them a lot in detailed understanding of the subject in concern and also helped in building the quality of team work. Lectures by clinicians were interesting and encouraged them to study the pre-clinical subjects better.

Further the performance of the students was also assessed by recording their year-wise results in the university examinations. The results showed progressive increase in the overall results of the batches of students exposed to IT unlike to those who were not exposed to the same (Table 2).

Table 2: *First year MBBS University examination results in Anatomy in the last six years.*

Year	Result (In Percentage)
2009	92.8
2010	92.7
2011	95
2012	96
2013	97.2
2014	98

Discussion

Medical education strives to improve and maintain the quality of health care delivered by doctors to patients. This process is directly related to the quality teaching in medical colleges (Kasselbaum, 1989). There is a growing concern among medical teachers that conventional teaching methods fail to bring out the right qualities in the students. Most medical colleges in India have traditional teacher-centered and hospital based training.

Six education strategies have been identified relating to the curriculum in a medical school. Each issue can be represented as a spectrum or continuum: student-centred/teacher-centred, problem-based/information-gathering, integrated/discipline-based, community-based/hospital-based, elective/uniform and systematic/apprenticeship-based. This is popularly called as the SPICES model of curriculum. This SPICES model of curriculum strategy analysis can be used in curriculum planning or review, in tackling problems relating to the curriculum and in providing guidance relating to teaching methods and assessment (Harden, 1984).

There are four major components in IT namely Integration of experience, social integration, integration of knowledge and integration as a curriculum design (Beane, 1997). IT is an important strategy to promote meaningful learning and make it last for a longer time; integration helps to efficiently recall knowledge when required (Singh et al, 2013). It connects skills and knowledge and thus bridges the gap between academic knowledge and practicals (Huber & Hutchings, 2004). To improve the quality of students and to have effective diagnosis and better treatment of the patients, integrated learning is the need of hour. In recent years throughout the world such curricula have been used by faculties to teach the students (Irby & Wilkerson, 2003; Shimura et al, 2004; Damegh, 2005; Ghosh & Pandya, 2008).

The present study revealed that the average marks obtained by students after an integrated teaching approach was greater than the marks obtained by students after the conventional teaching methods. Few other Indian studies have also confirmed the same (Kate et al, 2010; Doraisamy & Radhakrishnan, 2013). Students trained with integrated curriculum were more accurate in diagnosis of the clinical disorders than those trained in a conventional curriculum (Schmidt, 1996). IT improves the cognitive and psychomotor domains of students and creates interest in topics and eliminates the fear toward the subject. The study by Schmidt et al (1996) did not take into account the feedback of the students and faculty on the integrated teaching. However in the present study a positive feedback was obtained from the students, who insisted that IT should be a part of the teaching curriculum. This was in general agreement with Studies by Kate et al who showed that this teaching–learning method was welcomed with great enthusiasm both by students and faculty (Kate et al, 2010). The present study also stresses on sensitizing the faculty for effective implementation of the curriculum.

The Medical Council of India (MCI) currently stresses on the need based curriculum to create interest among the students (Dandannavar, 2010). In order to meet this end, the MCI in its amendment 2012 has recommended the integrated teaching method and also strives to make it a part of regular curriculum (Jamkar et al). The same has been efficaciously practiced in our institution.

Case presentations: In problem-based learning (PBL) courses, students work with classmates to solve complex and authentic problems that help develop content knowledge as well as problem-solving, reasoning, communication, and self-assessment skills. These problems also help to maintain student interest in course material because students realize that they are learning the skills needed to be successful in the field. Case presentation, as practiced in our department is a novel form of PBL. Overall, PBL is an effective method for improving students' problem-solving skills. Students will make strong connections between concepts when they learn facts and skills by actively working with information rather than by passively receiving information (Gallagher, 1997; Resnick & Klopfer, 1989). Although active learning requires additional work on the part of students and faculty, Kingsland observed that students find PBL courses satisfying (Kingsland, 1996). However in the present study the students stated that although PBL s are useful, they should not be conducted close to their examinations as it involves a lot of additional work and time and thus may affect their performance in examinations.

Guest lectures by clinical faculty: Yet another innovative method introduced in the IT program exposed the students to clinical scenarios well in advance during their pre-clinical course of study. This was incorporated in order to make the students understand the importance of the pre-clinical subjects in their clinical career. The topics were chosen in such a way that they are correlated to the particular preclinical topic which is been taught. This enticed the students to study the pre-clinical subjects with greater interest which was confirmed by their feedback.

Video demonstrations: Dissection class is a must and an integral part of the anatomy teaching curriculum. In our institution, in addition to the conventional dissection classes, students are allowed to revise using the dissected specimens. Revision classes in the form of video demonstrations are also regularly practiced. This method of learning is unique and is seldom practiced in majority of the medical institutions. Feedback revealed that video demonstrations deepened their understanding of anatomical structures, provided them with a three-dimensional perspective of structures and helped them recall what they learnt and therefore should be frequently practised in the curriculum. Authors in the past have suggested the incorporation of routine dissection in an integrated problem-based learning medical course, stating its benefits (Azer & Eizenberg, 2007). The present study agrees with the same. This was ascertained by positive feedback from the students and progressive examination results

Conclusion

IT is an advanced method to strengthen the teaching-learning process and has had a positive response from the student population. Integration between preclinical and clinical subjects plays a crucial role not only in learning experience but also for better problem solving in clinical practice. The present study analyzes the positive effects of IT and also forms a baseline upon which an integrated and clinically oriented assessment pattern could be implemented in the curriculum. IT can be enhanced by including case presentations by students, lectures by clinical faculty followed by discussion and video demonstrations of dissected specimens which is effectively being followed in our institution.

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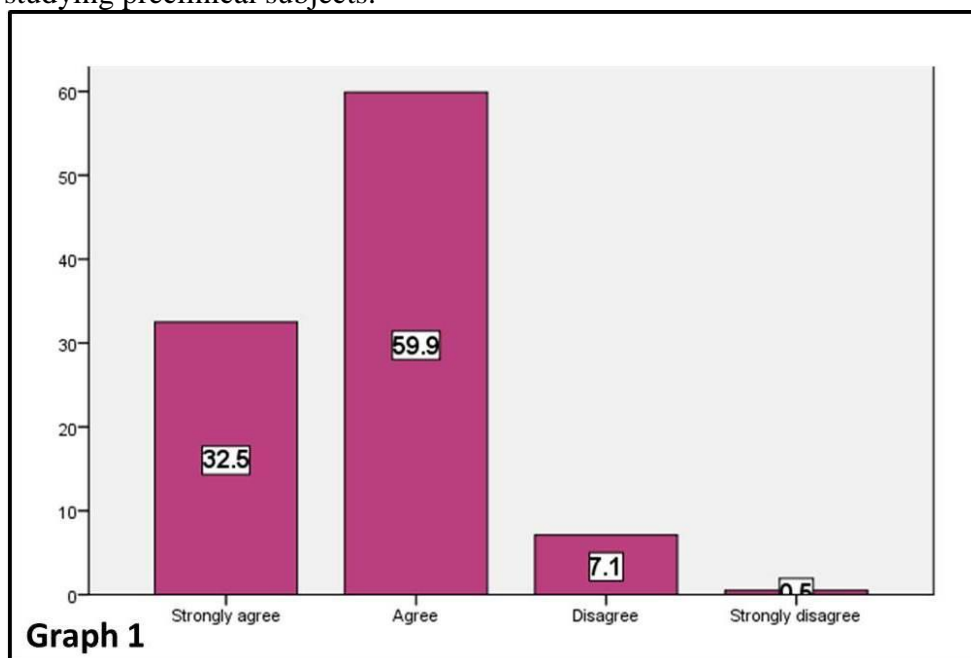
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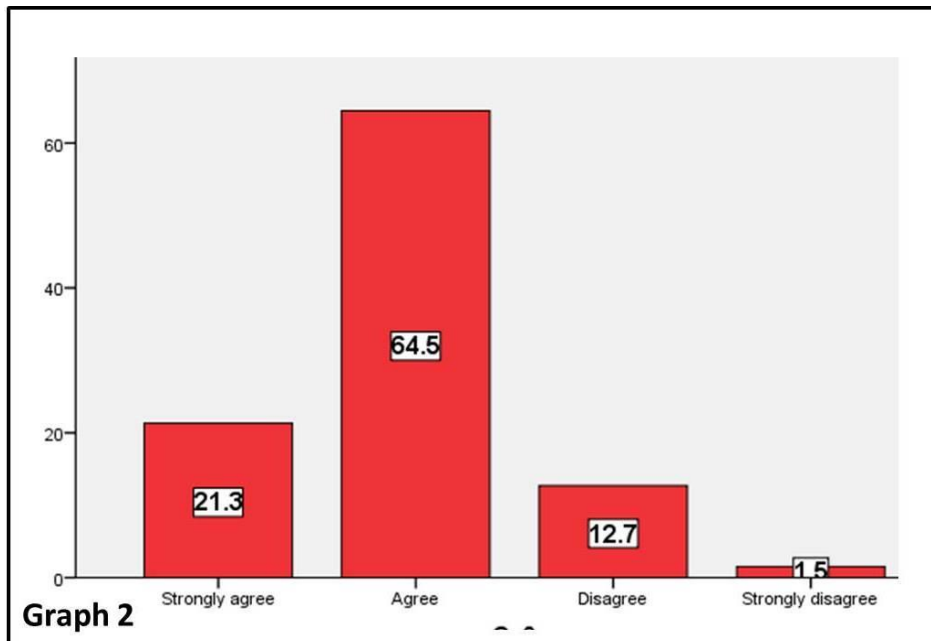
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APPENDIX

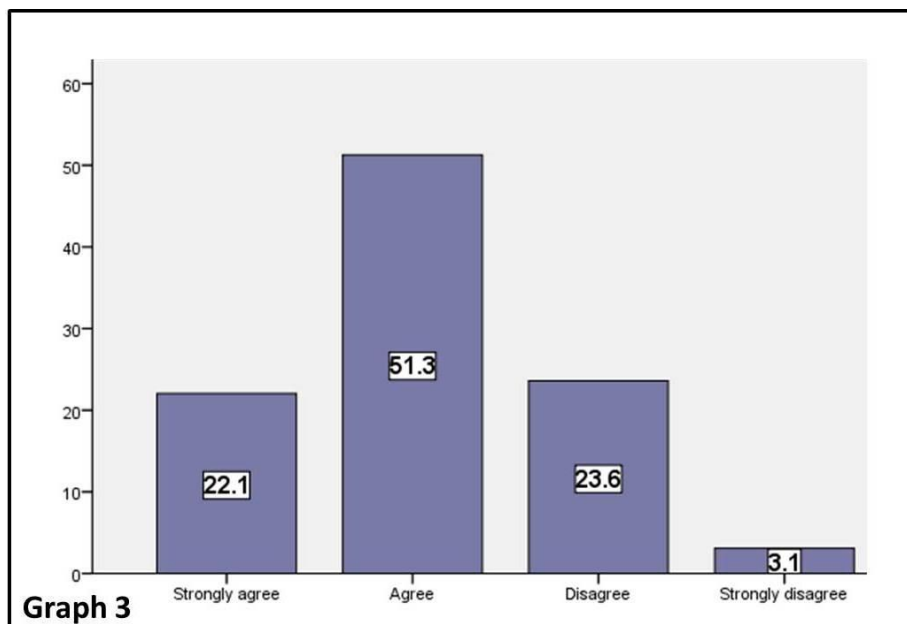
Graph 1: Integrated teaching (IT) gives confidence in approaching clinical cases & evoked interest in studying preclinical subjects.



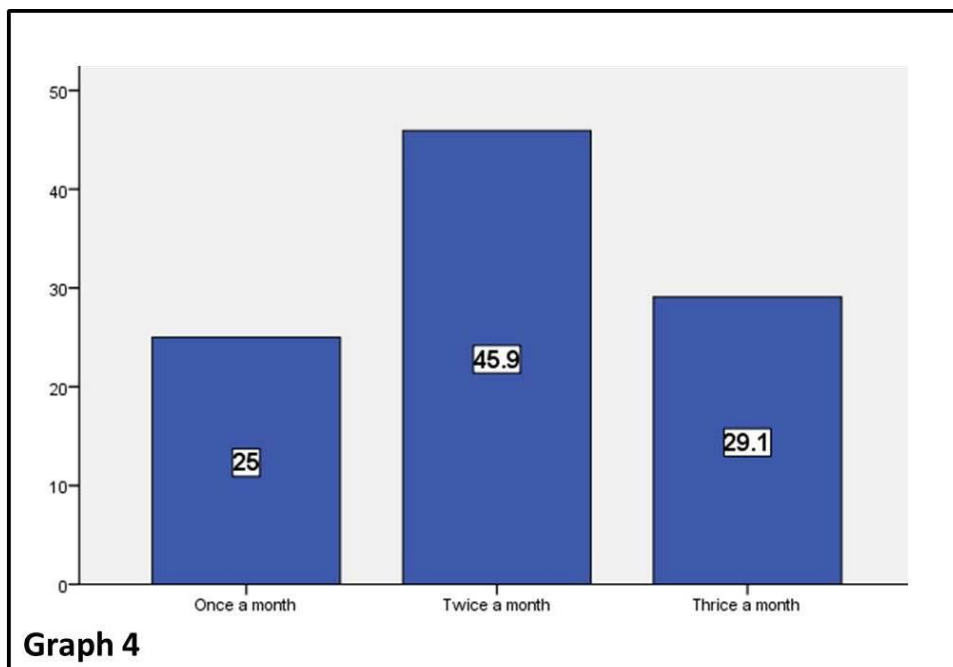
Graph 2: Integrated teaching (IT) helps to bridge the connection between academic knowledge and practical.



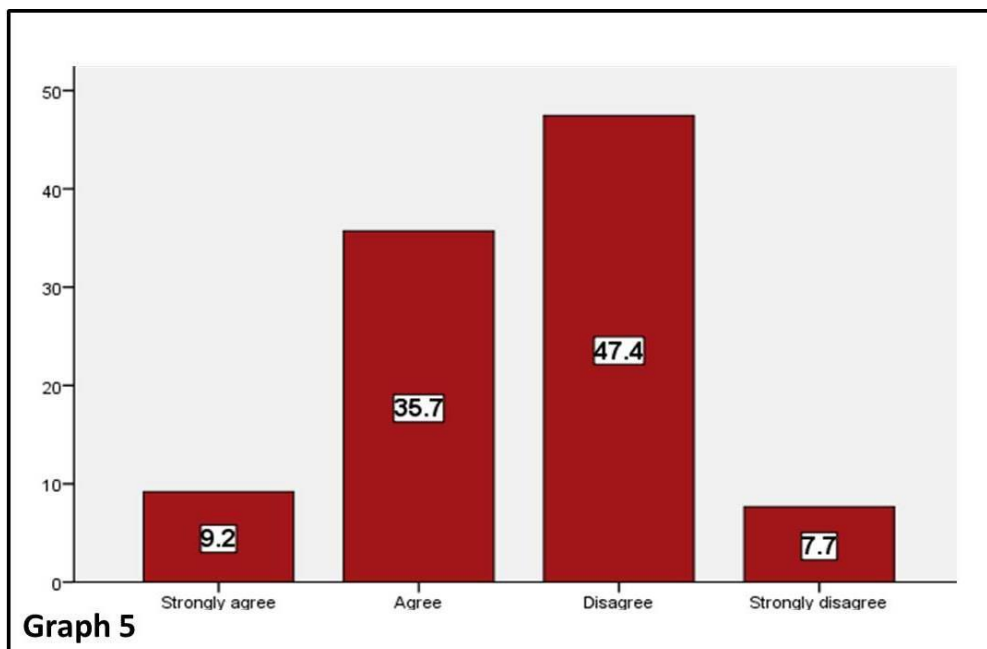
Graph 3: Integrated teaching (IT) is better than didactic lectures.



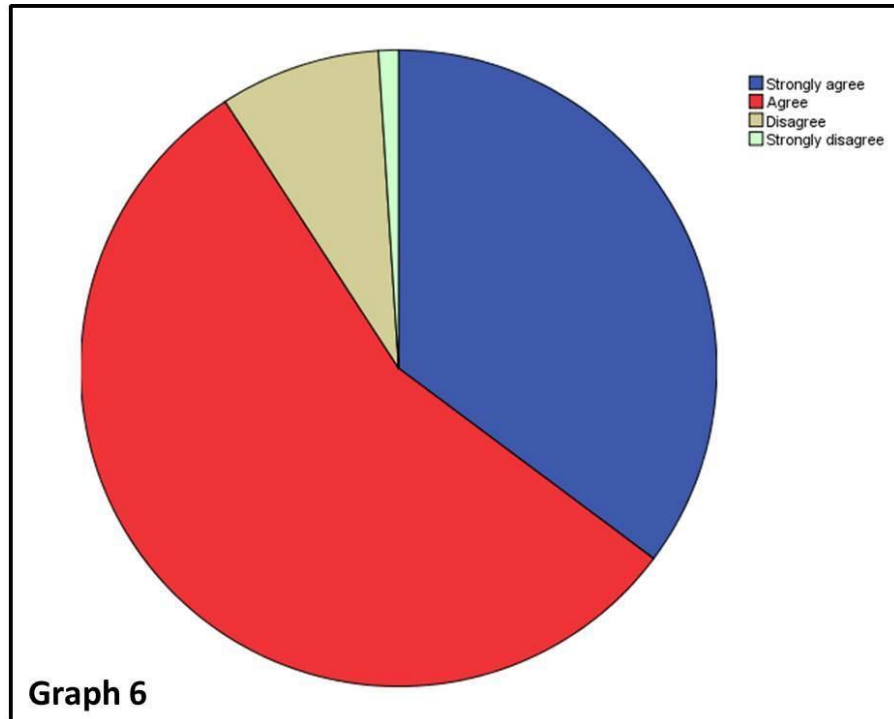
Graph 4: Integrated teaching (IT) should be conducted twice a month or more.



Graph 5: Integrated teaching (IT) helps in preparing for exams.



Graph 6: Implementation of Integrated teaching (IT) in preclinical departments is beneficial and must be compulsorily incorporated in a regular teaching curriculum.



School on Cloud: Transforming Education***

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Abstract

Nowadays for an appropriate way to deal with teaching and learning there is an axiomatic need to accept an integrated-holistic approach both in terms of the way we regard education and of how we practice it. This leads to a two-prong position: First, that education constitutes a dialectic entity and second that approaches to education presently in use are now absolute. That is, education has recently undergone a paradigm shift from a *Student Centred Learning* approach, which in its own way have replaced the traditional *Teacher Centred Instructing* approach, towards an integrating holistic approach, bringing education into the new *Net Centred Knowing* paradigm which is based on cloud computing and represents the goal and objectives of the School on the Cloud project presented in this paper.

Keywords: School on the Cloud, Paradigm, Integration, Cloud computing.

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Introduction

In epistemology, in the last few years, important differentiations have occurred related to the way we view our disciplines as well as their basic principles. The most important of these differentiations, as they relate to education, are the changes in the way we regard:

Teaching: from a process where teachers are using class time to lecture and dispense information to an approach where teachers facilitate student's learning.

Learning: from considering learning as a collection of factual and procedural knowledge to the acceptance that it is a process of acquiring new or modifying and reinforcing existing knowledge, behaviors, skills, values, or preferences and thus involves synthesizing different types of information.

Education: from the assumption that it is a form of learning in which knowledge, skills, values, beliefs and habits are transferred only under the guidance of educators, to the belief that learners should energetically participate in the educational process.

These changes in perception are of particular importance, because they clearly show the need for a new approach to Education, as the discipline of teaching and learning. More specifically, we need to clarify the fundamental principle that determines nowadays the way education is regarded and the methods used in teaching and learning.

Unambiguously and categorically, we would like to declare that at the centre of the pedagogic approach towards teaching and learning should be the concept of *integration*. This leads to the position of this paper that not only the traditional *Teacher Centred Instructing* educational paradigm, as well as the much herald present approaches to education, defined as the *Student Centred Learning* paradigm, are now absolute and we find ourselves in the period of the *Net Centred Knowing* paradigm which is based on Cloud Computing.

More specifically, the position presented here is simple in its explanation, but radical when is considered in terms of the excising beliefs and practices in the education community. That is, today's major educational stakeholders require capabilities such as: Students the ability of working and communicating without taking into account space and time; Teachers the mechanisms to receive unlimited support in preparing their teaching portfolio (presentations of lessons, conferences, articles, etc.), teaching practices (methods and teaching techniques, study materials, feedback) and evaluating (methods and techniques of evaluation and management of the results) (Thomas, 2009); Administrators the capability to design, build and test their programs as well as execute them fast and efficient. But these combined and simultaneous capabilities cannot be dealt with unless we accept the fact that they represent different manifestations of "a whole", the dialectic entity of education. Therefore, an integrated approach towards teaching and learning is required, an approach that is not possible without the help of the *networking abilities provided by Cloud Computing*.

The term "networking provided by cloud computing" has two components: The component "networking" refers to the integrated nature of education, which is equally important with the integrated efficiency of "cloud computing", the second component. The implications of

these is that: ***an integrated holistic approach in considering teaching and learning is imperative***. But understanding such an approach to teaching and learning is possible only through an examination of their nature and their evolution, which in turn determines how we perceive education as well as how we practice it.

However, these two dimensions have recently been involved in changes representing what epistemologist Thomas Khun (1962) has termed paradigm shifts and which are not rare events in disciplines like education. As a result, it is necessary to examine the current consideration of education and the approaches of practicing it as well as the way they have reached their present form.

Considering Education

The way we view education has altered in the last century following changes in the way we reconstruct societal values and consider important societal goals. That is, in order to successfully prepare students for the future we cannot continue educating them in ways that address education and market needs of the past (Fullan & Langworthy, 2013). As a result, although the world has been changing in ways that are not always easy to understand, at the same time it is imperative to be able to accurately respond and prepare our students for these changes and needs. In other words, every time a change is happening a new educational approach is needed to educate students for the challenging future (Gialamas et. al., 2013). This implies a stepwise process of changes in teaching, learning, managing and leading in education. Following is a brief presentation of these changes and the resultant responses which were determined by the way we considered education every time.

Monodisciplinary approach

From the beginning of the 20th century and for some years following World War II, education had a value that society systematically downgraded and considered it as just a tool in attaining other pressing societal objectives. This was accompanied by the inefficient way disciplines were operating. More specifically, every particular scientific endeavor was concerned only with its own subject area. As a result, concern for education was treated, like the rest of the disciplines, in a ***monodisciplinary*** manner. In other words, the teaching and learning aspects of education represented the exclusive realm of educators who were the only ones that could offer the methods, techniques and knowledge to handle education, for the simple reason that society and other scientist had little or no interest in them. In this monodisciplinary approach, however, the practitioners of every discipline through their “exclusive” paradigm, have been creating a ***“fragmented”*** approach to societal needs and obligations, including education which was providing a fragmented and mainly a descriptive learning process (the way students can learn). Therefore, it is of no surprise that educators followed the well known and long lasting traditional ***Teacher Centred Instructing*** paradigm, whose main teaching tool has been teachers' instruction (Fig. 1, first row).

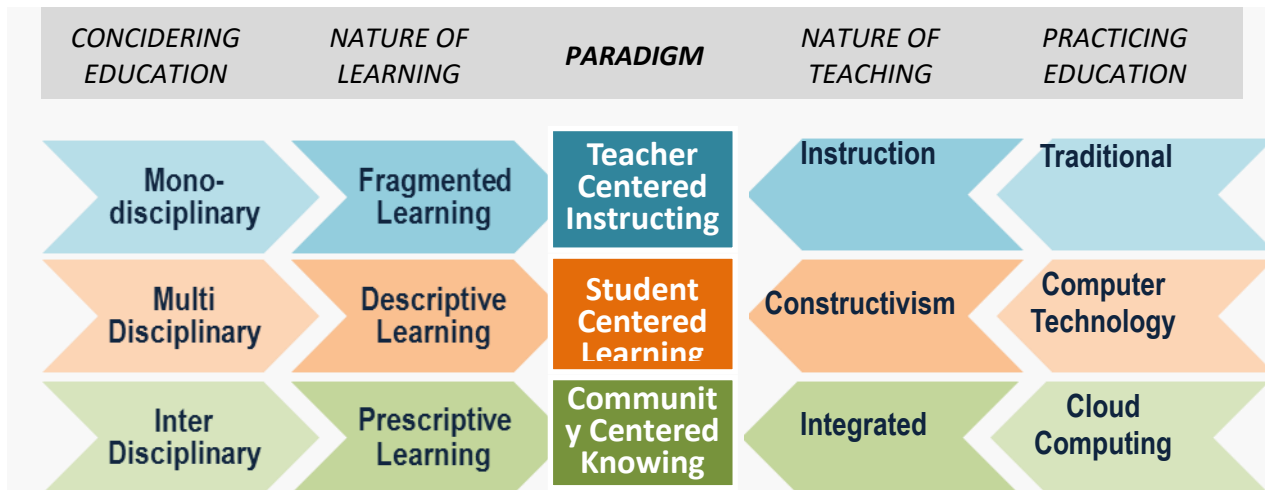


Figure 1: Changes in Education

Multidisciplinary Approach

In the 1970's the significance of education was recognized and the requirements of teaching and learning acquired a place at the centre of societal interests. In addition, however, there was the strong questioning of the monodisciplinary practices by the scientific community, which resulted in the development of an alternative consideration. More specifically, all societal needs and practices were required to be approached from various perspectives and concerns, which led to a *multidisciplinary* approach towards education. Under this perspective, education was treated by the society and other interested scientists as if it consisted of the sum of all the distinct parts of a multidimensional cultural, political, social, environmental and economic reality. In other words, because human knowledge necessitates "abstractions" of all aspects of reality, learning was expressed in the form of a set of *separate* relations, interdependences and interactions, providing still a descriptive learning education. But this notion of a descriptive - multidimensional education required a constructivism approach in the classroom, which in turn formed the basis of the education paradigm presently in use, defined as *Student Centred Learning*. A paradigm that is focusing, in a descriptive way, on both individual learners (their heredity, perspectives, backgrounds, talents, interests, capacities, and needs) and on learning itself (the best available practices that promote the highest levels of motivation, learning, and achievement for all learners) (Fig. 1, second row).

Interdisciplinary Approach

It is the strong belief of the authors that today this multidisciplinary approach cannot be acceptable anymore. It is suggested that an integrated approach is necessary, which has to be simultaneously cultural (i.e. new role of students), pedagogical (i.e. new role of teachers), technical/technological (i.e. use of the internet), administrative (i.e. new role of school administrators), social (i.e. a different disposition of parents towards school) and political (i.e. a different approach of government to school), in dialectic harmony and respecting all aspects of

teaching and learning an integral part of which are the basic education stakeholders (pupils, teachers and school administrators).

In other words, it is argued that a holistic learning approach is required in order to express the multidimensional relationships and interdependencies of all the stakeholders that constitute the specific entities participating in the education process, which is the "whole". As a result, an *interdisciplinary* approach is required, which leads towards the integration of all possible learning actors and approaches in order to overcome the compartmentalization of knowledge. However, such a regard of learning establishes a holistic education which provides *prescriptive* learning (the way students should learn) and leads towards a new paradigm in education, named in this paper *Net Centred Knowing*. That is, we suggest that the "participatory" approach of the student centered education, which emphasizes the active involvement of students in the learning process, now is being substituted by a holistic approach towards knowledge, which is the foundation of the new Net Centred Knowing paradigm (Fig. 1, third row).

Practicing Education

Pedagogical approaches provide the tools for teaching, but "which of them are used?", "what they are used for?" and "how to make best use of them?", depends on the attitudes and mind set of the education stakeholders and the way they regard education. For example, in the interdisciplinary-holistic consideration of education and in order to describe and comprehend the required approaches to teaching, a corresponding integrated pedagogical approach will be required, which will differ if education is considered in a different way. That is, the pedagogical tools used in determining teaching have necessary undergone an evolutionary process of change, which has been driven fundamentally by the increased necessity of integration.

That is, teaching methods as well as educational curricula have been changing, but the key to understanding these changes is the appreciation of the swift changes of how we regard education: from an old paradigm filled with traditional instruction methods to another anchored in computer technology and finally to a new one where cloud computing with its integration capabilities plays the central or the determining role. Therefore, it is suggested that practicing education has, in the span of a little more than half a century, undergone the following transformations (Fig. 1).

Traditional or Instruction Approach

The traditional approach, which lasted until a few years ago, was very simple: the teacher transmits information to students who passively listen and acquire facts. Pedagogically, in this approach subject matter and teaching methods are focusing on the simple transmission or instruction based curriculum. This leads to a Teacher Centered Instructing teaching process which Goodlad (1984) has described as:

Not "how" but "what" to learn dominated consistently. Teachers and children were busy covering' what was set forth in the textbooks and workbooks. Children, either as individuals or in groups, were not seeking solutions to problems identified by them as important and meaningful. Instead, they were moderately busy on assignments

predetermined by teachers. In general, the subject matter studied appeared to be remote from daily concerns and interests of the children. (pp. 13-14)

Moreover, this approach is characterized as the one in which (Cuban, 1993):

- Teacher talk exceeds student talk;
- Teachers look upon the textbook to guide curricular and instructional decision making;
- Instruction occurs frequently with the whole class; small group or individual instruction occurs less often;
- Use of class time is largely determined by the teacher;
- Classroom furniture is arranged into rows of desks or chairs facing a chalkboard;

As a result, as Fowler and Mayes (2000) pointed out, there is a "representational" view of learning with its concomitant "transmission of knowledge" by instruction approach, which determines the design and operation of the learning environment. Actually this approach to knowledge is so dominant in the learners' conceptions of learning that memorization is practically the exclusive path to learning. All these characteristics and practices lead towards the well known and long lasting traditional Teacher Centred Instructing paradigm (Fig. 1, first row).

Computer Technology or Constructivism Approach

The increased use of microprocessors altered the traditional teaching approach creating a new one based on *computer technology*. It was accepted by educators and policy makers alike that education had to be in the information business (or no business at all) and most of the pedagogical tasks in the classroom or outside it had to be accomplished by utilizing some form of computer technology. This resulted in the emergence of a new information education in the context of a world of computers and interactive software.

The use of computer technologies, however, emphasizes the importance of creating engaging learning environments that provide students with meaningful learning experiences from various forms of learning relationships which are the result of interactions between learners and content, learners and learners and learners and teachers (Anderson 2003; Godwin & Kaplan, 2008; McConnell, 2005). In other words this corresponds to a Student-Centered Learning education which involves both learning and the learner and most importantly is directed towards all the programs, policies and teaching in order to support: Students for effective learning; Teachers for being familiar with the instructional techniques that supports such learning; Administrators for developing a school environment that enhances that desirable learning; School counselors for improving both the conditions for learning (parent education, classroom environment, teacher attitude) and with helping each learner develop to his/her fullest potential.

But such an approach to education basically re-envision education by drawing on social constructivist educational philosophies (Holmes, et al, 2000; Fowler & Mayes, 2000; Cormier, 2008). An approach which emphasize the importance of interrelationships between persons participating in the teaching and learning processes and the kinds of interactions that need to be fostered in planning learning resources to create participatory learning experiences. In other words, it is based on *Constructivism*, and not *Constructionism*, a theory which is based on

observation and scientific study and determines how students learn and how they construct their own understanding and knowledge of the world, by experiencing things and reflecting on them.

As a result, the constructivist view of learning leads towards teaching practices encouraging students to use participatory techniques such as experiments and real-world problem solving, in order to formulate learning and reflect on, as well as talk about what they are doing and how their learning is improving. In other words, in the constructivist approach, nourished by computer technologies, students by questioning themselves and their strategies, become "experts" on their own learning, providing them with the necessary tools, in the classroom or outside it, to keep learning or *learn how to learn*. Thus establishing the education paradigm presently in use, defined as Student Centred Learning (Fig. 1, second row).

The Integrated or Cloud Computing Approach

Up to now the three basic educational stakeholders (students, teachers and administrators) were considered by the education community as independent and sometimes conflicting pedagogical forces (Koutsopoulos, 2008). However, the thesis of this paper is that such an approach is clearly scientifically shallow, logically unsound and mainly lacking the necessary integration required in the complicated and dialectic present day scientific, societal and educational environment. That is, although the adoption of new computer technology techniques in teaching is imperative; for example, Dede (2008) considers Web 2.0 as a "seismic" change in pedagogy. Nevertheless technology cannot be utilized alone, ignoring the other educational actors (i.e. teachers with no computer skills or lack of understanding from decision makers). The same is true in terms of the role of teachers. Clearly, nowadays teachers have to be involved in getting away from transferring knowledge to understand available information in context (this paper suggests cloud information) or using it to solve problems. But this cannot be achieved without the help of school administrators and/or public officials. A School Principal or the Ministry of Education can certainly design an innovative program, but if parents and teachers are not convinced to co-operate a failure is inevitable.

Basically, all stakeholders in the pedagogical process are teaching and learning factors, which have as common background their educational dimension. But most importantly, they are closely interrelated and not independent, inadvertently complementary and not conflicting and thus they can be integrated into an educational "whole". As a result, according to this paper, they should be considered as components of an integrated teaching approach representing different manifestations of a holistic teaching methodology.

In other words, the goal of the new way we practice education is to alter the approaches we catalyse learning and innovation as well as the ways which complement and enrich the individual's personal learning space. That is, the nature of teaching is a lot more and well beyond a constructivist approach, where learners actively participate in the educational process by simply using various tools. More specifically, the new way of practicing education encompasses beyond ICT tools, all stakeholders in different ways so that it:

- Transforms the role of pedagogy;
- Provides students with a variety of services the control of which is handed to them;
- Empowers learners to regulate their own learning;

- Changes the roles that teachers and educators play;
- Eases the burden of teachers on transferring knowledge;
- Creates new knowledge with skills;
- Provides Leadership and institutional change;
- Provides administrative support for a digital society in teaching and learning.

Cloud computing can fulfill all these capabilities because it represents a fundamental change in the way computing power is generated and distributed. Indeed, as Microsoft (2012) has declared "With Cloud computing in education, you get powerful software and massive computing resources where and when you need them (and we may add in any way you desire), in order to apply new educational approaches ... Cloud services can be used to combine on-demand computing and storage, familiar experience with on-demand scalability and online services for anywhere, anytime access to powerful web-based tools". More specifically, cloud computing according to a report by the School on the Cloud network (Koutsopoulos, 2015): "is a new ICT approach which by possessing five essential characteristics (*On demand service, Network access, Resource pooling, Rapid elasticity and Measured service*) can provide ubiquitous, rapid, convenient and with minimal management effort or service provider interaction, three forms of services (*Infrastructure service, Platform service and Software service*) that can be deployed in four fundamental types of the Cloud (*Private, Community, Public and Hybrid*)"

That is, it represents a framework which can successfully serve and support an integrated approach to education because:

- Its characteristics have a direct application to the integrated approach, because Net Centred Knowing education cannot be achieved without multitasking, the ability to handle a large number of users and applications, the need for flexibility as well as the ability to meet changing demands.
- It allows the major education stakeholders (students, teachers and administrators) to access stored files, e-mail, database and other applications from anywhere at request (Nicholson, 2009).
- It represents a familiar and appropriate tool for today's education stakeholders (the first generation to grow up within the digital technology era), who are familiar with using computers, videogames, video cams, cell phones, and all the other tools of the digital age.
- It qualifies as an ideal environment for the support of major education stakeholders, because it provides:
 - ✓ Students with the ability of working and communicating without taking into account space and time.
 - ✓ Teachers the benefit of unlimited support in preparing their teaching portfolio (presentations of lessons, conferences, articles, etc.), teaching practice (methods and teaching techniques, study materials, feedback) and evaluating

(methods and techniques of evaluation and management of the results) (Thomas, 2009).

- ✓ Administrators with the ability to design, build and test their programs.

From the previous discussion, it should be clear that cloud computing approaches, although similar to the computer technology ones in addressing teaching issues differ in one significant aspect. Namely, they represent the pieces of a holistic and integrating framework by providing an information system domain within which virtually all aspects of education can be practiced. This dialectic concept, by emphasizing a holistic view of education, is broader than data or information; it is open rather than closed; it can accommodate pluralistic teaching styles; and offers no restrictions on subject matter or curriculum. And thus provide the foundation of the new Net Centred Knowing paradigm (Fig. 1, third row).

In summary, it is suggested that in the last few years education, through two parallel changes in the way it is perceived and is applied, has gone through two paradigm shifts. From the Teacher Centred Instruction paradigm characterized by a monodisciplinary/fragmented approach with learning and traditional/instruction teaching methods, to the Student Centred Learning paradigm represented by a multidisciplinary /descriptive approach with learning and computer technology/constructivism teaching methods and finally to the new Net Centred Knowing paradigm expressed by an interdisciplinary /prescriptive learning approach with the teaching methods of integration/cloud computing as shown in Fig. 1.

The case for the new paradigm

This new paradigm based on the two pillars of how learning is considered (interdisciplinary/ prescriptive) and is practiced (integrated/cloud computing), can be defined as the process of answering pedagogical questions, solving teaching problems or addressing learning topics which cannot be dealt with adequately by a simple independent mono or multidiscipline approach. But most importantly, in approaching these educational issues the Net Centred Knowing paradigm draws on various perspectives that express multidimensional relations and interdependencies of the elements that constitute or represent specific entities or parts of the problem, topic, or question under consideration. Because all these are simultaneously ecological, economic, social, technical-technological, political and cultural. In this way organic integrations and not mechanistic sums are achieved, through the construction of a holistic perspective, based on modern day tools and in dialectic harmony with all education stakeholders. As a result, the Net Centred Knowing paradigm which is based on cloud computing is not a simple supplement, but a new and corrective of the presently used Student Centred Learning paradigm.

In addition, the main argument against the new paradigm can easily be rebuked. This argument presented mainly by those working within past paradigms, is that the Net Centred Knowing paradigm rests on a conceptual confusion or as professor Benson (1998) has stated: “integrated studies are a fool’s project, propounding equations where all terms are unknown.” However, the Net Centred Knowing paradigm as a connection between integration and interdisciplinarity with the use of cloud computing, should be understood as representing the confrontation of education stakeholders with the world, be it a pedagogical problem, an event or

even a teaching or learning question. But out of this phenomenological confrontation rises a situation which is too broad to be handled by a mono or a multidisciplinary approach and traditional or simple computer technology methods, with no regard for the holistic nature of that world. That is, the purpose of Net Centred Knowing paradigm is more than just to address questions that transect discipline boundaries or integrating insights or methods to illuminate teaching and learning issues. It involves an articulate spectrum of principles to help education stakeholders to determine when and how to confront the world by seeking out a holistic approach to interrelations and interdependencies, that can be achieved with the use of cloud computing.

School on the Cloud

From the previous discussion it should be clear that there is a need to thoroughly examine and evaluate the interface between education and cloud computing as well as explore how teaching and learning should respond to new ICT developments, in the form of cloud computing, that are transforming education and will continue to do so in the immediate future. That need and the ideas behind it were shared by many ICT experts and educators, some of which had an opportunity in a meeting for ICT in education in Spain on April 2012, to discuss them. These discussions resulted in an idea for a School on the Cloud proposal which was submitted and approved creating the School on the Cloud: connecting education to the Cloud for digital citizenship network (SoC).

Goals and Objectives

The basic goal of the SoC is to evaluate the state of the art, by examining and assessing a wide range of topics related to Cloud based education such as: tools, methodologies, pedagogical issues and visions. Moreover, the SoC network seeks to achieve its goal and objectives by addressing the following two key questions: How should education respond to cloud-based technologies? What is the impact, now and in the future, on education stakeholders and teachers?

Answering these questions in essence puts the foundations in applying the new Net Centred Knowing education paradigm. The reason is simple: as learning becomes increasingly digital, cloud-based developments become the necessary vehicle for a new integrated way to education (Donert, 2014). An approach that aligns with the way we think, share, learn and collaborate, inside and outside the classroom, which in turn allows education to be holistic as well as bring into teaching and learning the necessary dynamic, interactive and multimedia tools.

However, selecting, implementing and managing cloud-based services, school-wide collaborative tools, educational forms etc. are not easy tasks. Although education and learning responding to present day needs and requirements has to be supported by cloud computing, there remain issues to be resolved related mainly to their interface during the transition from the old to the new paradigm that is taking place right now (Donert & Bonanou, 2014). That is, although there is a rich production of research projects and applications on the present state and the future of education on one hand and on cloud computing on the other, each area has been examined individually with no real concern for their interaction. The literature has yet to provide answers to issues concerning their interface. In other words, there is a need for examining the status of cloud based education, which has to address both these areas as they are combining and interacting.

Moreover, the literature (Meier, 2012; Gutta, 2012; Cruz, 2011; Northgate, 2012) indicates that cloud computing is not a novice technology that promises to deliver many exciting things. It is already a reality and there are many educational implementations of it. However, evaluating the maturity it has reached, its present and anticipated pace of growth as well as its effects are not easily attainable objectives, but they are achievable as long as there is a good grasp of them. Following is such an examination of the effects which are emerging from the impact of cloud computing in education as well as in teaching and learning and which are elaborated in more details in a SoC document (Koutsopoulos, 2015).

What Cloud Computing Brings to Education

Experience and the literature (IBM 2013; Gaytos, 2012; Sultan, 2010; Duggan, T., 2012) shows that there is a range of resources and services available to education using cloud computing, whether they concern infrastructure, services, solutions or the introduction of new processes. That is, cloud computing brings many benefits to education of which the following are considered the most commonly referred and important.

Savings: The cloud promotes in general, and in education in particular, a cost effective use of ITC resources, by reducing all kind of costs;

Flexibility: One of the main benefits of cloud-based teaching and learning is that it can prevent individual investments in equipment, programs etc. The reason is that the centralized infrastructures of cloud computing promote flexibility in various ways;

Effectiveness: Cloud computing by promoting a dynamic exchange and participation between teachers and students, their social network and parents, leads into: first, finding the appropriate to the stage of education information and tools and second, an effective learning and teaching process (Tuncay, 2010).

Sharing: Cloud computing provides the means in every institution to avoid the duplication of resources that exist elsewhere. That is, skills, good practices, applications, teaching content and infrastructures can be pooled and shared.

Real time Access: Cloud computing allows students and teachers to access in real time useful and free information from anywhere in the world in a matter of seconds.

Reduces the Risk of Obsolescence: For all practical purposes cloud computing provides an “anti-obsolescence” insurance against technological changes, because it can cope better and more efficiently with their increasingly rapid development.

What Cloud Computing Brings to Teaching and Learning

There have been significant advances in ICT, in the form of cloud computing, that continue unabated up to now. As a result, there is an increasingly perceived vision that cloud based education should be the single most important path towards a successful education. In other words, it is suggested that the use of cloud computing in the classroom has an impact on the fundamental elements of classroom education (the subjects taught and the teaching and learning

methods in attaining them), as well in the changing role of several influential factors (Koutsopoulos, 2015), as shown below:

Subjects: In terms of the teaching subjects it is suggested that cloud computing is the 4th fundamental subject that students should master (after reading, writing and arithmetic). That is, education is being transformed into an activity of providing an additional subject that is commoditized and delivered along with the traditional 3R subjects.

Learning: Several studies (i.e. European Commission/ Horizon Report Europe: 2014 Schools Edition, European Commission/Ala-Mutka et. al., 2010 and Beyond Current Horizons Program/Facer and Sanford, 2010) support the thesis of this paper that recent developments related to dexterities, skills and competences, require changes in our schools. Among these changes the most important are:

- Learning should be focused on Four not the three Basic Object Competences;
- Learning should be tailored to the Needs of Individuals;
- Learning should be based on a Holistic New Vision;
- Learning should be active and Connected to Real Life;
- Learning should be towards Open, Flexible and Networked Relationships;
- Online Learning should be strengthen;
- Distance Learning should be strengthen;
- Hybrid Learning should be strengthen;
- Flipped Learning should be strengthen;
- Non- Formal Learning should be strengthen;
- Network learning should determine the design of a curriculum.

Teaching: In the learning and the digital landscape in which education is presently operating, requires comparable teaching methods (Vuorikari et. al 2010). Some of those are:

- Collaborative Teaching
- Collective Teaching
- Personalized Teaching
- Parents Teaching
- Real-time Assessment
- Predictive Analysis in Teaching

The Changing Role of Education Elements: Cloud Computing with the recourses it provides to educational elements, it forces them to adapt to the developing situations, which in turn change their place and role in the education process. Among them the most **adept** to change are:

- *Teachers:* Teachers role must change to be capable of:
 - ✓ Guiding students in the new “time-space” that is created;
 - ✓ Guiding and advising them in the new methods of learning (i.e. social networks, online discovering, etc.);

- ✓ Acting as referees to avoid bad habits (i.e. filtering unsound knowledge gleaned from the internet or from “friends” on social networks);
 - ✓ Basing their teaching on collaboration between students and promoting their more energetic participation in classes.
- *School Administrators:* The administration of any institution has to adapt and reflect the new ways of teaching and learning. Educational changes have brought about new conditions that need to be imposed and become operational, such as:
 - ✓ New forms of curricula;
 - ✓ Assessment approaches and networking;
 - ✓ New practices that work, can be shared and make visible and learnable their results
 - ✓ Both, top-down and bottom-up approaches to make changes happen.
 - ✓ Support Innovation in all educational and administrative aspect of an institution
 - ✓ Facilitate the monitoring and dissemination of good practices.
 - *Transforming of Knowledge:* With the emergence of new technologies, teaching strategies and pedagogical approaches the way knowledge is transformed has to change.
 - *Social Media:* Technological developments have brought about changes in the role social networks must have for education shareholders, who must use them as professional communities of practice, as learning communities and as a platform to share information (Falconer, I., 2013).
 - *Open Education Resources:* Cloud Computing is an efficient conduit for open educational resources (OER), and as such it should be used.
 - *Data-Driven Learning and Assessment:* Cloud Computing has brought about changes on the role of data sources in the education process which must be used for personalizing the learning experience, for ongoing formative assessment of learning and for performance measurement

Conclusions

Present day students all of which have practically been born in the 21st century, representing the so called Z Generation, are growing and operating in an environment where collaboration and exchanges are spontaneous, learning has become ad hoc and networks are imperative, forming an intrinsic part of their lives. Moreover, surfing the Net looking for new encounters and experiences has become virtually their “first nature”. As a result, using yesterday’s teaching tools does not correspond to their needs and their very nature. To the contrary these tools can only create confusion and appear, to put it mildly, artificial to present day students. In fact, what the work of SoC demonstrates is that they actually deprive students of the

tools they need most to master the skills and dexterities that they will be required both in today's and tomorrow's world, and which in the world of education follow and are influenced by present and anticipated effects of cloud computing.

In 1964 Marshall McLuhan, introduced the phrase "the medium is the message", suggesting that the means in most cases is the end. This dictum is certainly appropriate in education, where there is a tight relationship between technology and learning. That is, as technology has become an agent of immense change, it has forced upon the education system cloud computing and has given rise to a generation of students who have never known life in school and elsewhere without a computer. These changes have a significant ripple effect on education. Presently, and more so in the near future, advanced technologies in the form of cloud computing have put education within the reach of many more individuals and allow the design of improved curriculum as well as teaching and learning methodologies.

In conclusion, the effort undertaken by the SoC up to now to address the changes in school education as a result of cloud computing, shows that this technology is shaping, changing and enabling new ways of accessing, understanding and creating knowledge, and will continue to be part of all education stakeholders' lives, because it can face the requirements posed by present day and future education and market needs. Moreover, all education stakeholders need tools such as those offered by cloud computing that are more versatile and can adapt to new developments. In other words, the position suggested is that ICT in the form of Cloud Computing already is and will continue to be an integral part of teaching and learning as well as managing schools.

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The Technology Leadership Competencies of Elementary and Secondary School Directors

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Abstract:

The aim of this study was to investigate the elementary and secondary school directors' technology leadership competencies in relation to some demographic features such as age, length of service and the state of whether taking in-service technology training. The universe of the current study employing descriptive survey model was comprised of 129 school directors working at 76 elementary and secondary schools in Menteşe district of the city of Muğla in 2013-2014 academic year. The sampling of the study consisted of 74 randomly selected school directors. As the data collection instrument, "The Scale of Educational Directors' Technology Leadership Competencies" developed by Banoğlu (2012) was used. This scale has five dimensions that are visionary leadership, digital age learning culture, perfectionism in professional practice, digital citizenship and systematic development. Within the context of the current study, the correlations between the directors' technology leadership competencies and gender, age, length of service and the state of whether taking in-service technology training were analyzed through t-test and One Way ANOVA. The findings of the analyses revealed that the dimension viewed to be the most important by the directors is systematic development. Moreover, a significant correlation was found between age and perfectionism in professional practice and between the state of whether taking in-service technology training and technology leadership, visionary leadership and digital citizenship.

Keywords: *Technology, Leadership, Director, Elementary Education, Secondary Education.*

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Introduction

Technological developments experienced in this information age affect educational systems and accordingly teaching and learning process. As a result of changes occurring in the field of technology, school directors' managerial support for the acquisition of educational technologies by schools, updating the existing technologies, the recruitment of specialized personnel, the use of new tools and equipments by teachers and the training of teachers (Brooks-Young, 2002; Eryaman, 2006, 2007; Tan, 2010). Therefore, schools need to be managed in a technology-friendly manner and should have a good technological infrastructure. In order to establish such a good infrastructure, school directors need to lead their schools in this direction (Akbaba and Altun, 2002; Brooks-Young, 2002; Akbaba-Altun and Güreş, 2008; Can, 2008; Hacifazlıođlu, Karadeniz and Dalgıç, 2010; Sincar, 2010; Bülbül and Çuhadar, 2012). As a new type of leadership for school directors, technology leadership is defined by Tanzer (2004) as "*the person who takes the initiative in the effective and efficient use of technology in the organization, influences, directs and manages the organization in this direction*" (cited. Akbaba-Altun, 2008). Technology leadership in education is an integrated process involving the motivation of the associates at school for learning, utilization and integration of technology into the environments they are working (Hacifazlıođlu et al., 2011a; Hayytov, 2013). In this connection, technology leadership of educational directors is of great importance in terms of the execution of the education system planned within the school, the effective and efficient use of technology during education, instructional and evaluation activities, the encouragement of the personnel working for the integration of technology into system and the provision of continuity in this encouragement (Can, 2008). Therefore, school directors as technology leaders have to take responsibility for the effective use of information and communication technologies in school management and in the class, acquire the required competencies to do so and improve their competencies (Hacifazlıođlu et al., 2011a; Bülbül and Çuhadar, 2012).

There are some roles to be undertaken by school directors as technology leaders. These roles are summarized in the literature (Akbaba-Altun, 2002; 2008; Anderson and Dexter, 2005; Can, 2008; Chang, Chin and Mei Hsu, 2008; Görgülü et al., 2013; Hacifazlıođlu et al., 2011a; Kozloski, 2006; Sincar, 2009; Turan, 2002; Yu and Durrington, 2006) to be related to the following: Technology-orientation, instructional program, infrastructure, facilitation, planning, communication, personal development, supervision, ethics, safety, technology budget, public relations, change and technology policy.

The competencies to be possessed by school directors for technology leadership have been determined by various organizations within the context of "educational technologies standards". ISTE (International Society for Technology in Education) whose headquarter is located in the USA adopted NETS-A (National Educational Technology Standards for Administrators). These standards define information and competencies needed by school directors from every level of schooling to be effective leaders in the application of technology (Şişman-Eren and Kurt, 2011). ISTE first issued NETS- A in 2002 and revised them in 2009. Technology leadership standards of ISTE were subsumed under six headings in 2002 and then they were revised in 2009 and reduced into five dimensions as visionary leadership, digital age learning culture, perfectionism in professional practice, digital citizenship and systematic development (Orhan et al., 2014; Yu and Durrington, 2006). According to these standards, the

characteristics to be possessed by the technology leader are explained as follows: (Hacıfazlıoğlu et al., 2010):

1. *Visionary Leadership*: Educational directors inspire and lead people to develop and implement a shared vision to realize a comprehensive technological integration across the organization and support perfectionism and transformation.
2. *Digital Age Learning Culture*: Educational directors create, support and maintain a digital age learning culture offering suitable and attractive education for all students.
3. *Perfectionism in Professional Practice*: Educational directors try to strengthen professional development and innovation activities to enhance student learning by means of the integration of contemporary technologies and digital resources.
4. *Systematic Development*: Educational directors offer the leadership and management of digital age for the continuous development by making effective use of information and communications resources.
5. *Digital Citizenship*: Educational directors design a conception of related social, ethical, legal and responsibilities conducive to the development of digital culture.

These standards developed by ISTE in America gave inspiration to other countries to develop their own standards and many attempts have been made in this direction (Bülbül and Çuhadar, 2012; Görgülü et al., 2013). When the literature of the recent years is examined, it is seen that there is an increase in the number of studies aiming to determine the technological competencies of school directors (Anderson and Dexter, 2005; Duncan, 2011; Grey-Bowen, 2010; Kozloski, 2007; Macualay, 2009; Wang, 2010; Puckett, 2014; Weng and Tang, 2014; Ismail et al., 2015). There is some research directed to determine the technology leadership competencies of school directors on the basis of NETS-A standards (Tanzer, 2004; Akbaba-Altun and Gürer, 2008; Can, 2008; Şişman-Eren, 2010; Hacıfazlıoğlu et al., 2010, 2011a, 2011b; Banoğlu, 2011; Eren and Kurt, 2011; Banoğlu, 2012; Bülbül and Çuhadar, 2012; Çakır, 2012; Görgülü et al., 2013; Hayytov, 2013; Orhan et al., 2014). In this line, the purpose of the current study is to determine the technology leadership competencies of elementary and secondary school directors.

For this purpose, the main problem of the current study is to determine the technology leadership competencies of elementary and secondary school directors. Thus, the current study sought answers to the following questions:

1. What are the leadership competencies of elementary and secondary school directors in relation to visionary leadership, digital age learning, perfectionism in professional practice, digital citizenship and systematic development sub-dimensions?
2. Do the elementary and secondary school directors' technology leadership competencies vary significantly depending on gender, age, length of service and the state of whether taking in-service training about technology?

Method

At the current study, conducted to determine the technology leadership competencies of elementary and secondary school directors, one of the descriptive research methods, survey method, was employed. As there are comparisons made in relation to gender, age, length of service and the state of whether taking in-service training about technology sectioning approach is adopted and as it is intended to determine the relationship between the continuous variables, relational screening approach is adopted (Çepni, 2010).

Universe and Sampling

The universe of the current study employing descriptive survey model is comprised of 129 school directors working at 76 elementary and secondary schools in Menteşe district of the city of Muğla in the spring term of 2013-2014 academic year. The sampling of the study consists of 74 randomly selected school directors. The demographic features of the participants are presented in Table 1.

Table 1. *Demographic Features of the Participants*

Demographic variable		N	%
Gender	Male	56	75.7
	Female	18	24.3
Age	20-35 years old	9	12.2
	36-45 years old	22	29.7
	46 years old or older	43	58.1
School	Elementary	21	28.4
	Secondary	22	29.7
	High school	31	41.9
Position	Director	26	35.1
	Vice director	48	64.9
Length of service	11-15 years	18	24.3
	16-20 years	17	23.0
	21 years and more	39	52.7

Data Collection Instrument

In the study, a questionnaire including a personal information form and the scale of technology leadership competencies of school directors was employed to collect data. The scale was developed on the basis of “Educational Directors’ Technology Leadership Competencies Scale” developed by Banoğlu (2012). It is comprised of 32 items and 5 dimensions and named as “Educational Directors’ Technology Leadership Competencies Scale” (EYÖTELYÖ). “Visionary leadership” sub-dimension of the scale consists of 12 items, “digital age learning culture” sub-dimension consists of 3 items, “perfectionism in professional practice” consists of 8 items, “digital citizenship” sub-dimension consists of 6 items and “systematic development” sub-dimension consists of 3 items. The lowest score to be taken from the scale is 32 and the highest score is 160. The reliability of the scale developed by Banoğlu (2012) was analyzed. As a result of the analysis, Cronbach Alpha reliability coefficient of the scale was calculated to be .97. Cronbach Alpha coefficients for the sub-dimensions of the scale were found to be ranging from

.89 to .98. The scale was found to be reliable and valid in the determination of the school directors' technology leadership competencies.

Data Analysis

For the analysis of the collected data, IBM SPSS 21.0 package program was used. In the determination of the school directors' opinions about their technology leadership competencies, statistical measurement tools such as frequencies (f), percentages (%), arithmetic means and standard deviations were used. In order to determine whether the directors' opinions change depending on some variables, t-test was carried out in relation to gender and the state of whether taking in-service training and one-way variance analysis (ANOVA) was conducted in relation to age and length of service. LSD test was used in the detection of the source of the difference found as a result of one-way variance analysis.

Findings

In order to find an answer to the first research question, the means and standard deviations presented in Table 2 related to technology leadership competencies were examined.

Table 2. Means and Standard Deviations for Educational Technology Leadership Competencies of the Directors

	Mean	SS
Technology Leadership General Factor	4.02	.69
Visionary Leadership Dimension	3.94	.79
Digital Age Learning Culture Dimension	3.95	.79
Perfectionism in Professional Practice	4.05	.75
Digital Citizenship Dimension	4.06	.74
Systematic Development Dimension	4.28	.78

As can be seen in Table 2, while the directors' technology leadership competency was the lowest in terms of "visionary leadership" dimension (Mean= 3.94), the higher competencies were found for "digital age learning culture" dimension (Mean=3.95), "perfectionism in professional practice" dimension (Mean=4.05), "digital citizenship" dimension (Mean=4.06) and "systematic development" dimension (Mean=4.28). General technology competency mean score of the directors working at elementary and secondary schools is 4.02. These findings show that the directors' technology leadership competency level is "good" in terms of general technology leadership and its sub-dimensions.

In order to find an answer to the second research question of the study, the results of t-test related to the correlations between gender and the state of whether taking in-service training about technology and technology leadership competency are presented in Table 3 and Table 6 and the results of one-way variance analysis (ANOVA) related to the correlations between age and length of service and technology leadership competency are presented in Table 4 and Table 5.

Table 3. *The Results of Independent Samples t-test conducted to Reveal Whether the Directors' Technology Leadership Competencies Vary depending on Gender Variable*

	Gender	N	Mean	Sd	df	t	p
Technology Leadership General Factor	Male	56	4.08	.57	72	1.17	.24
	Female	18	3.86	.97			
Visionary Leadership Dimension	Male	56	4.01	.71	72	1.26	.20
	Female	18	3.74	.99			
Digital Age Learning Culture Dimension	Male	56	3.98	.69	72	.63	.52
	Female	18	3.85	1.06			
Perfectionism in Professional Practice	Male	56	4.10	.60	72	.98	.32
	Female	18	3.90	1.10			
Digital Citizenship Dimension	Male	56	4.09	.63	72	.54	.58
	Female	18	3.98	1.02			
Systematic Development Dimension	Male	56	4.38	.64	72	1.81	.07
	Female	18	4.00	1.09			

As can be seen in Table 3, 56 of the participants were male and 18 were females. The school directors' technology leadership competency scores do not vary significantly depending on gender [$t_{(72)} = 1.17, p > .05$]. Though not significant, the male school directors' technology leadership competency is higher than that of the female directors. Moreover, the directors' technology leadership competencies do not vary at visionary leadership dimension [$t_{(72)} = 1.26, p > .05$], digital age learning culture dimension [$t_{(72)} = .63, p > .05$], perfectionism in professional practice dimension [$t_{(72)} = .98, p > .05$], digital citizenship dimension [$t_{(72)} = .54, p > .05$] and systematic development dimension [$t_{(72)} = 1.81, p > .05$] depending on gender. Again, though not significant, the male directors' visionary leadership, digital age learning culture, perfectionism in professional practice, digital citizenship and systematic development scores are higher than those of the female directors.

Table 4. *The Results of One-way Variance Analysis (ANOVA) conducted to Reveal Whether the Directors' Technology Leadership Competency Scores Vary depending on Age Variable*

Variable		N	Mean	Sd			
	(1) 35 years old and younger	9	4.33	.34			
	(2) 36- 45 years old	22	3.82	.92			
	(3) 46 years old and older	43	4.06	.58			
Technology Leadership General Factor	Variance Source	MS	df	SS	F	p	Difference LSD
	Between Groups	1.79	2	.89	1.90	.15	
	Intra Groups	33.52	71	.47			--
	Total	35.32	73				

As can be seen in Table 4, the results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly depending on age variable revealed that the difference between the arithmetic means of the groups is not significant ($F=1.90; p > .05$). Thus, it can be claimed that school directors' technology leadership competency is not significantly influenced by age variable. Moreover, the school directors' technology leadership competency scores according to

their ages from the highest to the lowest are as follows: 35 years old and younger (4.33), 46 years old and older (4.06) and 36-45 years old (3.82). Thus, it can be argued that the technology leadership competency of the middle-aged directors is relatively lower.

The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at visionary leadership sub-dimension depending on age variable revealed that the difference between the arithmetic means of the groups is not significant ($F=.79;p>.05$). Moreover, the school directors' visionary leadership scores according to their ages from the highest to the lowest are as follows: 35 years old and younger (4.22), 46 years old and older (3.94) and 36-45 years old (3.82). When compared to the other age groups, the visionary leadership mean score of the directors who are in the age group of 35 years old and younger is higher.

The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at digital age learning culture sub-dimension depending on age variable revealed that the difference between the arithmetic means of the groups is not significant ($F=1.17;p>.05$). Moreover, the school directors' digital age learning culture scores according to their ages from the highest to the lowest are as follows: 35 years old and younger (4.22), 46 years old and older (4.03) and 36-45 years old (3.69). When compared to the other age groups, the mean score of digital age learning culture of the directors who are in the age group of 35 years old and younger is higher.

Table 4a. *The Results of One-way Variance Analysis (ANOVA) conducted to Reveal Whether the Directors' Perfectionism in Professional Practice Sub-dimension of Technology Leadership Competency Vary depending on Age Variable*

Variable		N	Mean	Sd
	(1) 35 years old and younger	9	4.43	.41
	(2) 36- 45 years old	22	3.75	.98
	(3) 46 years old and older	43	4.13	.61
<i>Perfectionism in Professional Practice Dimension</i>	Variance Source			
	Between Groups	MS	df	SS
		3.56	2	1.78
				F
	Intra Groups			p
		37.59	71	.53
	Total	41.15	73	
				Difference LSD
				1>2;3>2

As can be seen in Table 4.a, the results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at perfectionism in professional practice sub-dimension depending on age variable revealed that the difference between the arithmetic means of the groups is significant ($F=3.36;p<.05$). Following this finding, complementary analyses (posthoc) were conducted to determine the source of the difference. First, the homogeneity of the variance was checked and it was decided that the variances are homogenous ($LSD= 4.05;p<.05$); therefore, LSD test was preferred. The results of LSD analysis showed that this difference is between the age group of 35 years old and younger and the age group of 36-45 years old in favor of the age group of 35 years old and younger ($p<.05$) and between the age group of 46 years old and older

and the age group of 36-45 years old favoring the age group of 46 years old and older ($p < .05$). The differences between the arithmetic means of the other groups were not found to be significant ($p > .05$). Moreover, the school directors' perfectionism in professional practice scores according to their ages from the highest to the lowest are as follows: 35 years old and younger (4.43), 46 years old and older (4.13) and 36-45 years old (3.75).

The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at digital citizenship sub-dimension depending on age variable revealed that the difference between the arithmetic means of the groups is not significant ($F = 1.10; p > .05$). Moreover, the school directors' digital citizenship scores according to their ages from the highest to the lowest are as follows: 35 years old and younger (4.33), 46 years old and older (4.08) and 36-45 years old (3.90). When compared to the other age groups, the digital citizenship mean score of the directors who are in the age group of 35 years old and younger is higher.

The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at systematic development sub-dimension depending on age variable revealed that the difference between the arithmetic means of the groups is not significant ($F = 2.62; p > .05$). Moreover, the school directors' systematic development scores according to their ages from the highest to the lowest are as follows: 35 years old and younger (4.62), 46 years old and older (4.36) and 36-45 years old (4.00). When compared to the other age groups, the systematic development mean score of the directors who are in the age group of 35 years old and younger is higher.

Table 5. *The Results of One-way Variance Analysis (ANOVA) conducted to Reveal Whether the Directors' Technology Leadership Competency Scores Vary depending on Length of Service*

Variable				N	Mean	Sd		
				18	4.20	.51		
				17	3.89	1.04		
				39	4.00	.57		
Technology Leadership Factor	General	Variance Source	MS	df	SS	F	p	Difference LSD
		Between Groups	.87	2	.43	.89	.41	
		Intra Groups	34.45	71	.48			--
		Total	35.32	73				

As can be seen in Table 5, the results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly depending on the length of service variable revealed that the difference between the arithmetic means of the groups is not significant ($F = .89; p > .05$). Thus, it can be claimed that school directors' technology leadership competency is not significantly influenced by their length of service. Moreover, the school directors' technology leadership competency scores according to their length of service from the highest to the lowest are as follows: 15 years and less (4.20), 21 years and more (4.00) and 16-20 years (3.89). As a result, it can be argued that the technology leadership competency of the directors having medium length

of service is lower than those of the other groups. The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at visionary leadership sub-dimension depending on length of service variable revealed that the difference between the arithmetic means of the groups is not significant ($F=.37;p>.05$). Moreover, the school directors' visionary leadership scores according to their length of service from the highest to the lowest are as follows: 15 years and less (4.08), 21 years and more (3.90) and 16-20 years (3.88). When compared to the other groups, the visionary leadership mean score of the directors whose length of service is 15 years or less is higher. The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at digital age learning culture sub-dimension depending on length of service variable revealed that the difference between the arithmetic means of the groups is not significant ($F=1.19;p>.05$). Moreover, the school directors' digital age learning culture scores according to their length of service from the highest to the lowest are as follows: 15 years and less (4.20), 21 years and more (3.88) and 16-20 years (3.84). When compared to the other groups, the digital age learning culture mean score of the directors whose length of service is 15 years or less is higher.

The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at perfectionism in professional practice sub-dimension depending on length of service variable revealed that the difference between the arithmetic means of the groups is not significant ($F=1.55;p>.05$). Moreover, the school directors' perfectionism in professional practice scores according to their length of service from the highest to the lowest are as follows: 15 years and less (4.29), 21 years and more (4.03) and 16-20 years (3.85). The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at digital citizenship sub-dimension depending on length of service variable revealed that the difference between the arithmetic means of the groups is not significant ($F=.76;p>.05$). Moreover, the school directors' digital citizenship scores according to their length of service from the highest to the lowest are as follows: 15 years and less (4.21), 21 years and more (4.06) and 16-20 years (3.90). When compared to the other age groups, the digital citizenship mean score of the directors whose length of service is 15 years or less is higher.

The results of one-way variance analysis conducted to determine whether the elementary and secondary school directors' technology leadership competency varies significantly at systematic development sub-dimension depending on length of service variable revealed that the difference between the arithmetic means of the groups is not significant ($F=.67;p>.05$). Moreover, the school directors' systematic development scores according to their length of service from the highest to the lowest are as follows: 15 years and less (4.42), 21 years and more (4.29) and 16-20 years (4.11). When compared to the other age groups, the systematic development mean score of the directors whose length of service is 15 years or less is higher.

Table 6. *The Results of Independent Samples t-test conducted to Determine Whether the Directors' Technology Leadership Competency Scores Vary Significantly depending on the State of Whether Taking In-service Training about Technology*

	Taking in- service training	N	Mean	Sd	df	t	p
Technology Leadership General Factor	Yes	65	4.09	.69	72	2.11	.03
	No	9	3.57	.54			
Visionary Leadership Dimension	Yes	65	4.02	.78	72	2.23	.02
	No	9	3.40	.67			
Digital Age Learning Culture Dimension	Yes	65	3.99	.81	72	1.16	.24
	No	9	3.66	.52			
Perfectionism in Professional Practice Dimension	Yes	65	4.11	.74	72	1.79	.07
	No	9	3.63	.68			
Digital Citizenship Dimension	Yes	65	4.12	.73	72	2.00	.04
	No	9	3.61	.66			
Systematic Development Dimension	Yes	65	4.33	.80	72	1.32	.18
	No	9	3.96	.58			

As can be seen in Table 6, 65 of the directors have taken in-service training about technology and 9 have not. The school directors' technology leadership competency scores vary significantly depending on the state of taking in-service training about technology [$t_{(72)} = 2.11$, $p < .05$]. This difference is in favor of the directors having taken in-service training about technology. Moreover, visionary leadership scores [$t_{(72)} = 2.23$, $p < .05$] and digital citizenship scores [$t_{(72)} = 2.00$, $p < .05$] of the directors having taken in-service training are significantly higher than those of the ones not having taken. On the other hand, having taken in-service training about technology does not lead to significant differences in relation to digital age learning culture dimension [$t_{(72)} = 1.16$, $p > .05$], perfectionism in professional practice dimension [$t_{(72)} = 1.79$, $p > .05$] and systematic development dimension [$t_{(72)} = 1.32$, $p > .05$]. The technology leadership competency scores and scores from its sub-dimensions taken by the directors having taken in-service training about technology are higher.

Discussion and Results

The findings of the current study revealed that the school directors' general technology leadership competency mean score, visionary leadership mean score, digital age learning culture mean score, perfectionism in professional practice mean score are "high" and their systematic development mean score is "very high". In this regard, it can be argued that the directors view their technology leadership competency as high. This finding concurs with the findings reported by Ergişi (2005), Kozloski (2007), Can (2008), Macaulay (2009), Eren-Şişman (2010), Banoğlu (2011), Hacifazlıoğlu et al., (2011a), Bülbül and Çuhadar (2012); yet, not supported by the findings of Erden and Erden (2007), Sincar and Aslan (2011).

In light of the findings of the current study, it can be claimed that the school directors see themselves most competent at "Systematic Development" sub-dimension and it is followed by "Digital Citizenship", "Perfectionism in Professional Practice", "Digital Age Learning Culture"

and “Visionary Leadership”. Banoğlu (2011) conducted a study to determine the elementary and secondary school directors’ technology leadership competencies and found that the lowest competency belongs to “leadership and vision” sub-dimension and this finding is similar to our finding. The school directors view their competency at “systematic development” sub-dimension as “high” and this can be interpreted as their putting forth the required effort to establish and maintain the technological infrastructure conducive to teaching and learning processes at school and they regard their competency at “digital citizenship” sub-dimension as “very high” and this can be interpreted as their supporting the generation and maintenance of the policies for the legal, ethical and secure use of technology at school environment and trying to enhance the interaction based on digital tools and digital access that can meet the needs of students. High competency of the school directors in relation to digital learning sub-dimension contributes to effective use of information and communications technologies at school environment. Furthermore, the directors’ viewing their competency at “perfectionism in professional practice” as very high is of great importance in terms of comfortable use of information and communications technologies and provision of the necessary time and resources. The school directors’ regarding their “visionary leadership” competency as very high is important for the formation of comprehensive technology at school because effective leadership to construct the infrastructure and understanding of technology at school is of vital importance (Anderson and Dexter, 2005; Wang, 2010; Bülbül and Çuhadar, 2012).

In the current study, it was found that the school directors’ technology leadership competency scores and scores taken from its sub-dimensions do not vary significantly depending on gender and length of service. This finding concurs with the findings of Baltacı (2008), Çetin-Yılmaz (2008), Görgülü et al., (2013), Can (2008), Şişman-Eren (2010). In addition, the school directors’ technology leadership competency and visionary leadership scores, digital age learning culture, digital citizenship and systematic development scores do not vary significantly depending on age. This finding is similar to the finding reported by Hayytov (2013). A significant difference was found between perfectionism in professional practice and age. At perfectionism in professional practice sub-dimension, a significant difference was found between the age group of 35 years old and younger and the age group of 36-45 years old in favor of the age group of 35 years old and younger and between the age group of 46 years old and older and the age group of 36-45 years old in favor of the age group of 46 years old and older. It is seen that the school directors from the younger and older age groups have more positive attitudes regarding perfectionism in professional practice sub-dimension and thus it can be concluded that they are more willing and consistent towards the use of technology for professional development.

The school directors’ general technology leadership competency score, visionary leadership and digital citizenship scores were found to be varying significantly depending on the state of whether taking in-service training about technology. The technology leadership competency score, visionary leadership score and digital citizenship score of the directors not having taken in-service training about technology were found to be significantly lower than those of the directors having taken in-service training about technology. Thus, it can be argued that in-service training about technology can make positive contributions to the directors’ technology leadership competency, visionary leadership and digital citizenship. This finding is not supported by Hayytov (2013).

In the current study conducted to determine the school directors' technology leadership competencies, it was found that the school directors' technology leadership score, digital citizenship score, perfectionism in professional practice score, digital age learning culture score and visionary leadership score are "high" and their systematic leadership score is "very high" and technology leadership competency and its sub-dimensions do not vary significantly depending on gender, age and length of service but vary significantly depending on the state of whether taking in-service training about technology. Moreover, it was concluded that the directors' perfectionism in professional practice scores vary significantly depending on age and visionary leadership and digital citizenship scores vary significantly depending on the state of whether taking in-service training about technology. Thus, following suggestions can be made for researchers, directors and the Ministry of National Education:

1. Attempts should be made to improve the middle-aged school directors' perfectionism in professional practice.
2. Greater emphasis should be put on in-service trainings.
3. Researchers need to focus on research aiming to reveal directors' technology leadership competency.

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Miscellany

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