Chapter 4: Data analysis and findings

Chapter Four

Data analysis and findings

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4.1   Introduction

The academic puzzle that drives this study is the influence of the principal's inspirational actions on teachers' attainment of ICT skills for integration of technology and enhanced instruction. In the previous chapter I described the research design and methodology of used in this study. I justified the choices I made with regard to the selection of respondents. The qualitative approach and method used to analyse the data are justified. The purpose of this chapter is to report on my analyses of the data in the integrated data set.

Through reviewing the literature (Chapter 2), interviewing the seven principals, compiling my own field notes and comments, I established a preliminary set of codes for the initial deductive analysis phase. These preliminary codes guided me to reduce the data and to establish initial emerging patterns. Inductive reasoning allowed me to construct new codes and there after combine some codes to form new categories. Berg (2001, p. 246) states that: "The development of inductive categories allows researchers to link or ground these categories to the data from which they derive." These categories addressed the heart of the research question. I gained a better understanding of the themes underpinning the main research question. Seale, Gobo, Gubrium, Silverman (2004, p. 475), as well as Marshall and Rossman (1999, p. 151) indicate that data analysis starts by coding each incident into as many categories as possible and as the analysis continues, the data then is placed into categories. These categories may consequently be modified or new categories may emerge. Through the interpretive approach I explored the meaning and interpretations the respondents bestowed on their social environments. This enabled me to describe and explain the principals' influences on TPD for ICT integration. I ascertained an in-depth understanding of the scope and depth of principal's influence on ICT integration in schools.

I have been a teacher in the same school for twenty years. This involvement provided me with the opportunity to experience the leadership of three different principals and this exposure provided me with the insight that, although the general circumstances at the school did not change much, the three different principals influenced me as a teacher at different levels. I started to ask the question: What were the differences? One difference was the principals' attitudes towards the integration of ICT, leadership and management styles, as

well as their strategic thinking motivated me to achieve at different levels. As I progressed with my study, I soon realised that principals do not perceive their actual influence on teachers in their schools.

To gain an in-depth understanding of principals' influence, I divided the main question into sub-questions. In this chapter I report my findings of the analyses of the data according to the sub-questions:

- **Sub-question 1:** How do principals' influences differ with regard to ICT integration in their schools?
  This question refers to the principals different leadership and management styles of principals as well as the different factors associated with their attitude towards ICT integration.
- **Sub-question 2:** How does principal's strategic thinking of TPD influence ICT integration?
  This question explores and describes the dynamics associated with strategic thinking of TPD for ICT integration in order to diminish barriers to the effective integration of ICT in teaching and learning.
- **Sub-question 3:** What are the enabling strategies that principals can follow to develop and sustain teachers' integration of ICT in teaching and learning?
  This question will explore the different enabling strategies essential for effective and sustainable ICT integration through TPD.

4.2   How do principals' influences differ with regard to Information and Communication Technology integration in their schools?

The aim of every principal is to lead and manage the school to achieve and maintain excellence in teaching and learning. In spite of this common aim, principals' influences on the teachers' integration of ICT vary. Their influence can be either positive, and lead to effective and sustainable ICT integration, or be negative and lead to ineffective or unsustainable ICT integration and a general sense of dissatisfaction among the teachers. West-Burnham (1992, p. 117) states: "No school improves without being led." Principals' influence is determined by the way they lead and manage. Various authors indicate the influence of the principal's leadership on teaching and learning (Butler, 1992, p. 11; Knapp & Glenn, 1996, p. 9; Young et al., 2005, p. 25). Many authors regard a principal's leadership as the determining factor for the success and sustainability of educational change (Akbulut et al., 2007, p. 2; Bush, 2003, p. 10; Southworth, 2005, p. 76; Steyn & Van Niekerk, 2005, p. 6;

Wallace & Poulson, 2003, p. 229). I established initial codes (Figure 4.1) according to the indications from the literature about the importance of leadership.
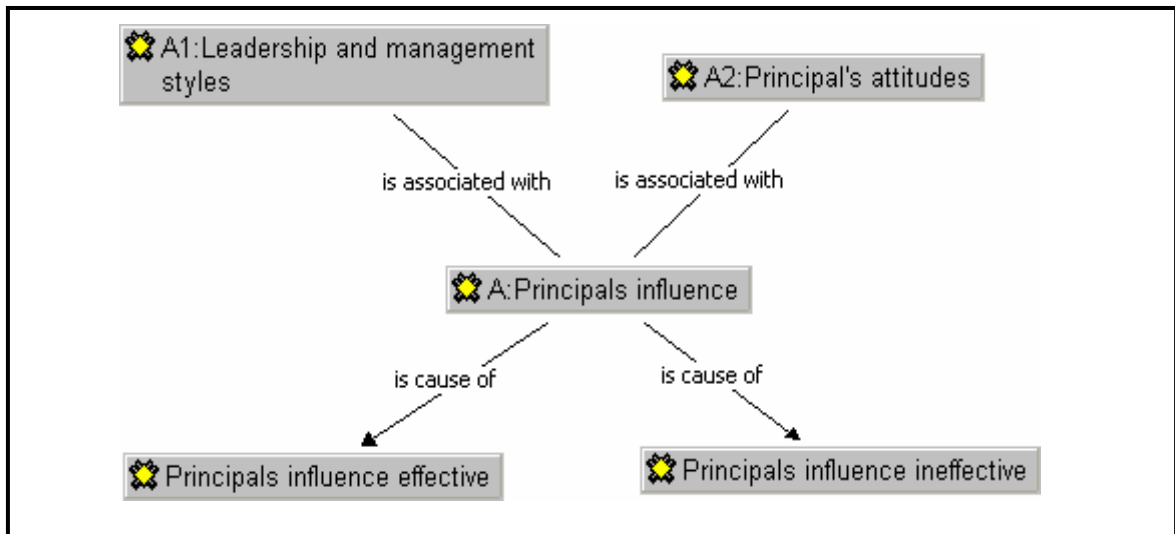
Figure 4.1   Influence of different attitudes, leadership and management styles

Figure 4.1 indicates the patterns of leadership and management. Principals have different leadership and management styles in their support of effective teaching and learning. Some applied a combination of styles, depending on their particular environment, circumstances and the experience of the teachers they lead:

- *I am very democratic…* [1] (3:594 (61))
- *… I really try to involve the people in management and I think I am really not an autocrat* [2] (4:319 (49))
- *Sometimes a person has to be a bit autocratic* [3] (3:601 (61))
- *One is where I would say I do a democratic way where I allow giving an input but at the same time I would try to force a particular direction* (6:389 (85)).

Another aspect of a principal's influence is the attitude of the principal (Figure 4.1). Han (2002, p. 294) maintains that the able principal has the capacity to influence, lead and motivate teachers to better performance and to encourage innovative changes in teaching and learning. Davies and Davies (2005, p. 23) mention that without the principal's interest and enthusiasm a school cannot be strategically focused. The respondents indicated that their attitude towards ICT integration differed:

- *I think a person can still do more* [4] (4:314 (37))
- *…try to motivate the teachers…* [5] (8:206 (13))
- *So I think the way you teach, you must apply technology* [6] (1:700. (57))
- *We have now already implemented good things here by us* [7] (3:600 (61))

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[1] *Ek is baie demokraties …*
[2] *… probeer regtig die mense in die bestuur te betrek en ek dink ek is definitief nie 'n outokraat nie*
[3] *Partykeer moet 'n mens maar bietjie outokraties wees*
[4] *Ag ek dink 'n mens kan dit nog meer doen*
[5] *…probeer die ouens aanmoedig…*
[6] *So ek dink die manier van onderrig gee, moet jy tegnologie aanwend*

- *… like being very much recharged and everything the teachers learn they give to the learners* (5:356 (77)).

4.2.1 Leadership and management styles

My analysis indicates that a principal's leadership and management style can consist of three possible styles: democratic, authoritarian or laissez-faire (Figure 4.2).
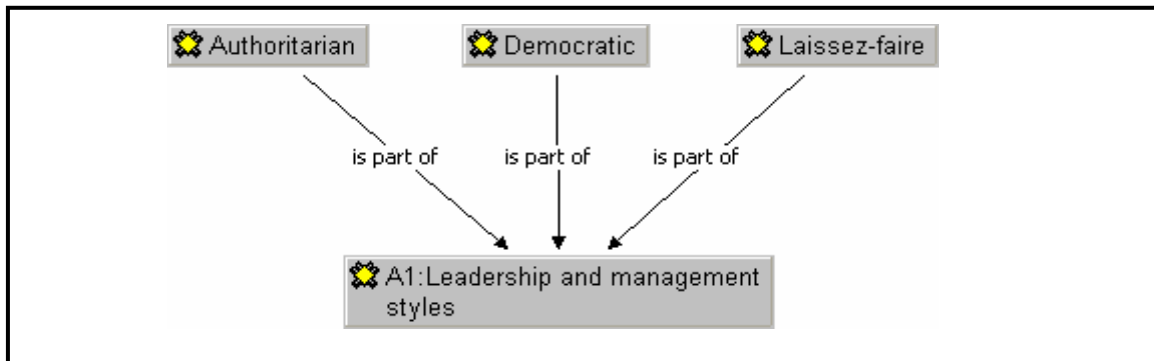
Figure 4.2 Different leadership and management styles as an influencing factor

Three respondents indicated their democratic style of management and leadership:

- *… we come together as a SMT, look at it and talk about it and see whether it could fit amongst ourselves or not* (5:340 (57))
- *The thing is that is where I think the principal and the SGB have an enormous responsibility because they are responsible together with the teachers* [8] (1:676 (137))
- *Because I think "the more heads the more knowledge* [9]*". I tend to ask the SMT and I would also ask individuals involved what do they think how should we go about it* (7:244 (61)).

Another respondent indicated his autocratic style by declaring that he delegated most of the ICT responsibility as well as authority to teachers and it appears that he was not accountable for the integration of ICT into teaching and learning:

- *… but the responsibility is actually the responsibility of the subject teacher and the different subject heads* [10] *(8:285 (17))*
- *… the teacher that currently runs the integration section for me, has trained teachers who are interested* [11] *(8:215 (33))*
- *… she is available but she is more of a facilitator and a help that makes these things available so she does not run the programme, the programme is actually more subject-driven* [12] *(8:203 (17))*
- *… the lady responsible for the media centre provides that information and updates them about courses* [13] *(8:234 (65))*.

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[7] *Ons het nou al baie goeie dinge geïmplementeer by ons*
[8] *Die ding is dit is waar ek dink die hoof en die beheerliggaam is geweldig verantwoordelik want hulle is tog verantwoordelik saam met die personeel*
[9] *…"hoe meer koppe hoe meer kennis"…*
[10] *… die verantwoordelikheid is eintlik die verantwoordelikheid van die vakonderwysers en die verskillende vakhoofde*
[11] *… die juffrou wat nou die integrasie afdeling dryf vir my het byvoorbeeld al vir personeel wat belangstel opleiding gegee*
[12] *… sy is beskikbaar maar sy is meer 'n fasiliteerder en 'n hulp wat die goed beskikbaar stel so sy dryf nie die program nie, die progam moet dan meer eintlik vak gedrewe wees*
[13] *… die dame verantwoordelik vir die mediasentrum gee daai inligting deur en hou hulle op hoogte van kursusse*

The same respondent also indicated a laissez-faire approach to leadership and management:

- *I think it is very difficult to draw the line and say I decide or they decide I think it is a combination of discussion and needs that emerge* [14] *(*8:242 (85))
- *Unknown is unwanted. If the teachers know and see the opportunities that are there then it happens* [15] *(*8:244 (93)).

Bush (2003, pp. 194-195) mentions that the application of different styles can increase the effectiveness of leadership and management. In an environment such as a school, teachers differ and it makes sense that different leadership and management styles should be used to accommodate all. Two respondents pertinently indicated their combination of leadership styles:

- *There are two ways. One is where I would say I do a democratic way where I allow giving an input but at the same time I would try to force a particular direction that is the vision that saying ultimately this is the direction that we need to follow. I know some other times it tends to sound that I am hard but I am quite aware it is that some of them don't have an idea and where should we take that, it is ICT in the environment that it is our own school (*6:390 (85))
- *Sometimes a person has to be a bit autocratic and sometimes there are certain things where you have to take a stand and then you make the final decision democratically, it works for me at this stage* [16] (3:601 (61)).

Through combining leadership and management styles, they in reality felt more capable of integrating and managing change effectively in their schools. Prinsloo and van Schalkwyk (2008, p. 167) point out that although there is no correct style, each style has advantages and disadvantages. A respondent described how he used the democratic style as he believed that it was the most appropriate style for his school:

- *No, I try to strive for the ideal, that of task and people orientation. No, I think a person must, I really try to involve the people in management and I think I am definitely not autocratic* [17] (4:318 (49)).

The same respondent indicated that he definitely did not use an autocratic style as he feared the negative impact it would have on the teachers' attitudes. It also emerged that he followed a laissez-faire style as there were no pre-established aims or requirements with regard to teachers' ICT integration:

- *No, there are no specific requirements* [18] 4:418 (45)
- *… he must make a new contribution somewhere* [19] 4:419 (49)

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[14] *Ek dink dit is baie moeilik om daai lyn te trek en te sê ek besluit of hulle besluit ek dink dit is 'n kombinasie van gesprekke en behoeftes wat uitkom*

[15] *Onbekend is onbemind. So as die ouens weet en hulle sien die geleenthede raak en die moontlikhede raak dan gebeur dit*

[16] *Partykeer moet 'n mens maar bietjie outokraties wees en partykeer is daar sekere dinge waaroor jy moet standpunt inneem en dan neem jy die finale besluit maar demokratiese styl, is vir my nogal, werk vir my op hierdie stadium*

[17] *Nee ek probeer maar die ideale nastreef, daai taak en mens georiënteerd is. Nee ek dink 'n mens moet, ek probeer regtig die mense in die bestuur te betrek en ek dink ek is definitief nie 'n outokraat nie*

[18] *Nee, daar is nie spesifieke eise nie*

[19] *… hy moet êrens 'n nuwe bydrae maak*

- *Responsibility no, I think a person must be eager to learn I must not look at somebody else to teach me* [20] 4:420 (81)
- *I don't know. A person must be careful how a person handles it* [21] 4:361 (109)
- *But a person only, I don't know my experience is you just annoy them more than what you get them to really do something well* [22] 4:368 (133).

The two respondents who applied the laissez-fair style seemed to experience a sense of aimlessness, a lack of focus and direction. Clarke (2007, p. 1) states: "Strong leadership and good management are both essential for the success of a school, and a good principal is skilled in both." Prinsloo and Van Schalkwyk (2008, p. 162) aptly summarise: "People look to the leader for clarity and direction."

In conclusion, principals' have unique styles of management and school leadership. The respondents in this study indicated that they followed the autocratic, laissez-faire and democratic leadership styles in their schools for ICT integration. Most principals have the mistaken belief that the democratic style is the most appropriate and advisable style to apply.

4.2.2 Principals' attitudes towards Information and Communication Technology integration

When entering the office of each respondent, I immediately take notice of the type of computer on the principal's desk. All the respondents had a personal laptop regardless of the size of the school, the financial or the security barriers. They all indicated that the laptop was essential for effective management and that they used it constantly:

- *… I mainly use it for the smart system this is the schools administrative system* [23] (1:613 (5))
- *On a daily basis. I have my computer on my table we use it fully for the schools admin, research, information and personal work* [24] (8:194 (5))
- *Every day and to retrieve information about learners when I have interviews with parents and teachers* [25] (3:541 (5))
- *Yes, I use it for schoolwork if I want to write stuff. Planning our timetable is on the computer, our marks admin is on the computer, the budget is on the computer, the finances are on the computer* [26] (4:300 (17))
- *My personal itinerary. Well I do use it almost on a daily basis…* (5:321 (21))
- *I carry a computer even now I having it is my laptop in my car I can't work without it I wonder if definitely for sure the laptop is actually I use it daily* (6:364 (33))
- *Daily all day long. Corresponding to the department, correspondence to the department and info on learners* (7:238 (17)).

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[20] *Responsibility, ag no, I think, 'n mens moet leergierig genoeg wees ek moet nie vir iemand anders kyk om vir my te leer nie*
[21] *Ek weet nie. 'n Mens moet versigtig wees hoe 'n ou dit hanteer*
[22] *Maar 'n ou maak hulle net, ek weet nie, my ervaring is jy maak die ou net meer kwaad as jy wat jy… hulle werklik waar kry om iets goeds te doen*
[23] *… ek gebruik hom hoofsaaklik jy weet vir die smart stelsel dis nou die skool se adminastratiwe stelsel*
[24] *Op 'n daaglikse basis. Ek het my rekenaar op my tafel ons gebruik hom volledig vir skool administrasie, navorsing, inligting en vir persoonlike werk*
[25] *Elke dag en om informasie van leerlinge te bekom as ek onderhoude het met ouers en personeel doen*
[26] *Ja, ek gebruik dit vir skoolwerk as ek goeters wil skryf. Beplanning, ons rooster is op die rekenaar, ons punte administrasie is op die rekenaar, die begroting is op die rekenaar, die finansies is op die rekenaar*

As leaders of their schools, the position automatically gave them the privilege of obtaining a laptop to assist them in their managerial tasks. I agree with Kalake (2007, pp. 143 - 145) research that principals' daily use of ICT enhances their knowledge and skills on using ICT in education and enables them to voice an opinion on the relevance of ICT in education. From my observations in the field I conclude that although all the respondents used ICT on a daily basis their attitudes towards ICT integration differed widely (Figure 4.3).
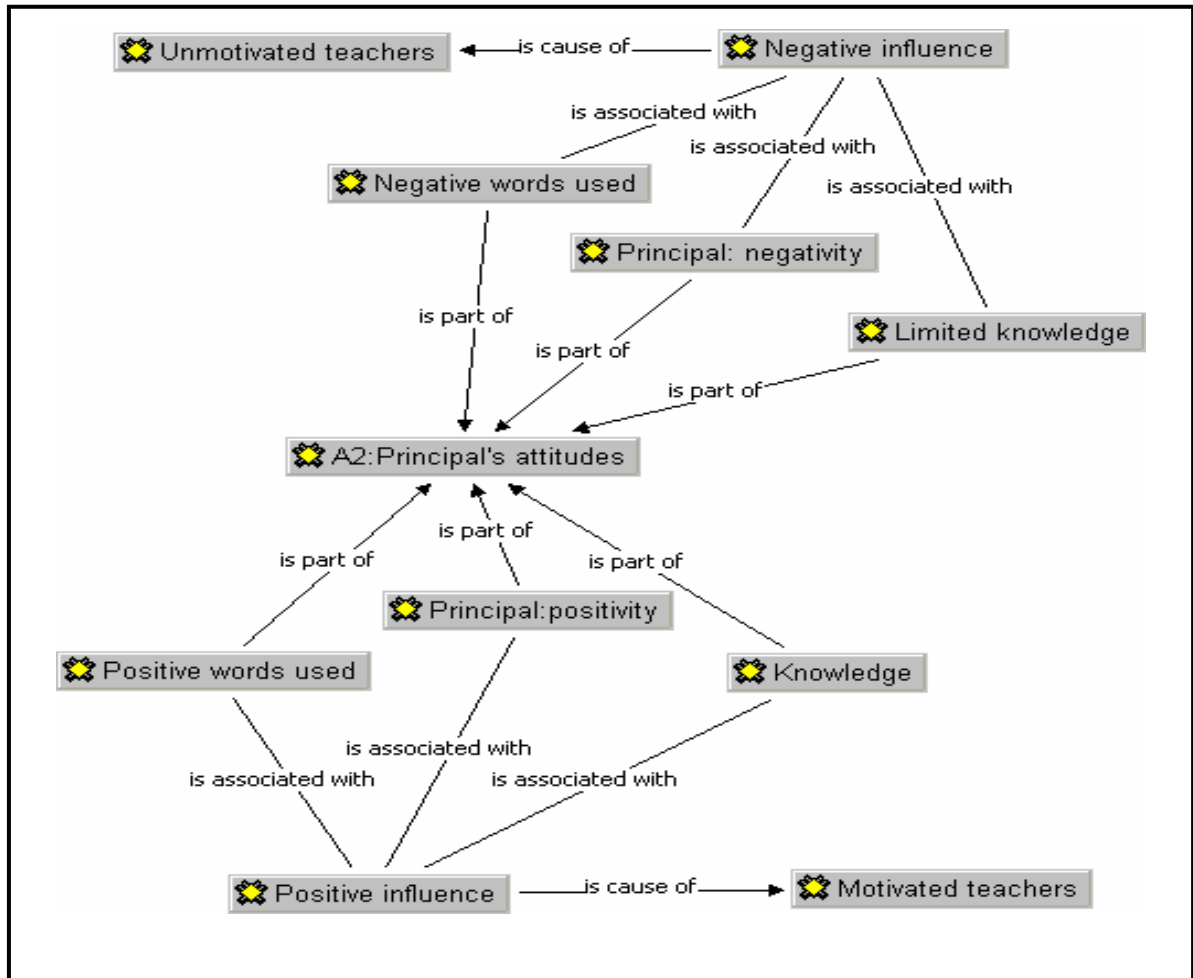
Figure 4.3   Principals' attitudes as an influencing factor

From my analysis it became apparent that the principal's attitude towards the integration of ICT in teaching and learning has an influence on teacher motivation to use ICT. Figure 4.3 indicates principals' attitudes have a positive influence and lead to motivated teachers, or a negative influence and lead to unmotivated teachers. Principals should recognise the importance of and promoting teachers' motivation as it is conducive to teachers' optimal performance (Everard et al., 2004, p. 25; Foskett & Lumby, 2003, pp. 79 - 80; Steyn & Van Niekerk, 2005, p. 143). Everard, Morris and Wilson (2004, p. 35) state: "The key to effective management is the ability to get results from other people, through other people and in

conjunction with other people. If the underlying psychology is wrong, the most carefully constructed system and techniques will fail."

Akbaba-Altun (2006, p. 186) points out principals' insufficient ICT-related knowledge leads to interpreting of regulations according to their own will. Southworth (2005, p. 88) states: "Leadership learning is necessary because creating learning schools rest, in large measure, on the quality of leadership." If principals are not knowledgeable about ICT-related issues and the latest TPD developments, they are not in a position to lead and manage ICT integration effectively. The code 'knowledge' captures this reasoning.

I observed that there was a distinct link between principals' positive attitudes towards ICT integration. Table 4.1 lists the factors associated with a principal's positive attitude to motivate or inspire teachers. From interviews one and three, I noticed that respondents did not mention that any teachers were unmotivated or unwilling to integrate ICT. I could sense the positive energy from the respondents when they talked about the use of ICT in their schools. I observed how these two respondents conveyed the positivism towards ICT in their schools. I noted how frequently the respondents used the word 'inspired'[27], and how they transferred this inspiration to their teachers. Davies and Davies (2005, p. 11), Dimmock and Walker (2005, p. 12), Clarke (2007, p. 1), Bush (2003, pp. 7 - 9), ICT op School (2006, p. 14), Ho (2006, p. 3) all agree that inspiring teachers attain objectives and implement change.

Table 4.1   Factors that relate to having a positive influence

Positive comments	Knowledgeable	Positive words	Motivated teachers
Respondent 1:			
• *It is absolutely necessary, you cannot teach here if you are not computer literate* [28] *(1:620 (9))* • *… you know that you have to be there and you have to make a plan to get there* [29] *(1:696 (77))* • *… have to apply technology in your classroom teaching and cannot get on without it* [30] *(1:705 (13))*	• *… we had with our teacher development we had a future's expert from the University* [31] *(1:692 (61))*	• *… extremely impressive* [32] *(1:718 (29))* • *… we have big dreams and plans* [33] *(1:720 (49))* • *… success that they experience* [34] *(1:723 (101))* • *… inspire* [35] *…* *(1:719 (33))*	• *So there is really a vibe, the teachers know we just have to be there and it has to happen* [36] *(1:658 (65))* • *…they are really highly motivated* [37] *(1:667 (97))*

[27] *… inspireer …*

[28] *Dis absoluut noodsaaklik jy kan nie meer hier skool hou as jy nie rekenaarvaardig is nie …*

[29] *… jy weet jy moet daar wees moet jy plan maak om daar te kom*

[30] *… jy moet hierdie tegnologie in jou klasaanbieding aanwend en kan nie meer daar sonder nie*

[31] *… ons het met personeel opleiding het ons hierdie goed van, ons het 'n toekomskundige gehad van die universiteit*

[32] *… geweldig indrukwekkend*

Table 4.1   Factors that relate to having a positive influence

Positive comments	Knowledgeable	Positive words	Motivated teachers
Respondent 3:			
• *We have now already implemented good things here* [38] *(3:600 (61))* • *I think it will be fantastic because a person is going to learn, you have to learn from each other* [39] *(3:620 (96))* • *So I am absolutely for teachers reaching out further than just here with us* [40] *(3:623 (45))*	• *… contact with subject advisers from other provinces and we attend their courses* [41] *(3:578 (45))* • *… done research at other schools, there is really no other software available for subjects* [42] *(3:608 (69))* • *I attended a symposium here of the minister of education* [43] *(3:656 (144))*	• *… just think how wonderful it will be* [44] *(3:626 (81))* • *… teachers are also hungry to do these things…* [45] *(3:645 (128))* • *… inspired* [46] *(3:646 (128))* • *… extremely excited* [47] *(3:666 (160))*	• *…everybody all of a sudden want to start working with computers, getting extremely inspired* [48] *(3:647 (128))* • *… not one teacher who at this stage is not extremely excited* [49] *(3:665 (160))*

There was also a relationship of the negative influences (Table 4.2). Those respondents who seem to convey a negative attitude towards ICT also used negative phrases.

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[33] *… ons het groot drome en planne*
[34] *… sukses wat hulle ervaar*
[35] *… inspireer*
[36] *So daar is regtig 'n vibe, die ouens weet net ons is daar en dit moet net gebeur*
[37] *… hulle is regtig hoogsgemotiveerd*
[38] *Ons het nou al baie goeie dinge geïmplementeer by ons*
[39] *Ek dink dit sal fantasties wees want 'n ou gaan leer, jy moet bymekaar leer*
[40] *So ek is absoluut ten gunste daarvan dat personeel moet wyer uitreik as net hier by ons*
[41] *… kontak met vakadviseurs van ander provinsies en ons gaan woon hulle kursusse by*
[42] *… navorsing gedoen by ander skole, daar is nêrens rêrig nog sagteware vir vakke nie*
[43] *Ek was op 'n simposium hier van die minister van onderwys*
[44] *… dink net hoe wonderlik dit sal wees*
[45] *… personeel is ook honger om hierdie goed te doen*
[46] *… geinspireer…*
[47] *… geweldig opgewonde…*
[48] *… almal wil ewe skielik nou begin rekenaar, hulle raak geweldig geinspireer*
[49] *… daar is een personeellid wat op hierdie stadium nie geweldig opgewonde is nie…*

Table 4.2   Factors that relate to having a negative influence

Negative comments	Limited knowledge	Negative words	Unmotivated teachers
Respondent 2:			
• *In the first place a person tries to motivate the teachers* [50] (8:205 (13))	• *Never heard of them…* [51] (8:231 (45))	• *Try* [52] (8:268 (13)) • *… it helps a little* [53] (8:272 (37)) • *Unknown is unwanted* [54] (8:274 (93)) • *Unpractical* [55] (8:275 (97))	• *… established ideas or a lack of, or resistance to change is possible the main thing* [56] (8:260 (121)) • *… a lot of teachers who say no thank you I don't need it* [57] (8:246 (97))
Respondent 4:			
• *A person sits with the older teachers that are not really clued up about it* [58] (4:314 (37)) • *… they do it to please …* [59] (4:423 (125))	• *I don't really know of other effective programmes* [60] (4:405 (209))	• *Try…* [61] (4:334 (73)) • *… I did it…* [62] (4:336 (77)) • *…it is all that I do* [63] (4:370 (133)). • *.. I am actually not interested in their stuff* [64] (4:350 (85)) • *… teachers' that think the principal is mad* [65] (4:402 (201))	• *… that resistance against change is always a factor…* [66] (4:400 (201)) • *… and the others do it because they must do it, they don't really do it for themselves* [67] (4:422 (201))

Figure 4.3 and Table 4.1 indicate that various factors contribute to a negative influence of teachers' effective and sustainable integration of ICT in their teaching and learning. I identified similar factors relating to teachers' non-motivation in respondents two and four. It was alarming to hear the same words repeatedly, e.g. 'try'[68].

This relates to the opinions of Foskett and Lumby (2003, p. 192), Blase and Blase (1994, p. 79), Steyn and Van Niekerk (2005, p. 23) who maintain that negativity demote and hampers the functioning of a school, as well as the attainment of objectives and opportunities for development. I wonder whether they have had limited success in the integration of ICT, or if the teachers were unmotivated. Respondent six indicated a majority of teachers avoid

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[50] *Eerstens probeer 'n ou die ouens aanmoedig…*
[51] *Nog nie van hulle gehoor …*
[52] *Probeer…*
[53] *… dit help 'n bietjie*
[54] *Onbekend is onbemind*
[55] *Onprakties*
[56] *… gevestigde idees of 'n gebrek aan, of teenkanting vir verandering is waarskynlik die groot ding*
[57] *… baie van die personeel wat sê nee dankie ek het dit nie nodig nie*
[58] *'n Ou sit maar daar bietjie met die ouer mense wat nie regtig, hulle is nie regtig so "opgeclue" daaroor nie*
[59] *… doen hulle om jou te plesier …*
[60] *Ek weet nie regtig van baie ander effektiewe programme …*
[61] *Probeer…*
[62] *… het dit gedoen*
[63] *… dis maar al wat ek maar doen*
[64] *… ek stel nie regtig belang in hulle goed nie*
[65] *… onderwysers wat dink ag man die hoof is mal…*
[66] *… daai weerstand teen verandering is maar altyd 'n faktor…*
[67] *…en die ander doen dit omdat hulle dit moet doen, hy doen dit nie regtig vir homself nie*
[68] *… probeer …*

integrating ICT in teaching and learning and preferred traditional methods of teaching: … *would say sixty percent of them still stick to the old method* (6:407 (141)). However, the respondent remained positive and regarded it as a challenge and also made plans to obtain the interest of his teachers: *… a big challenge what I eventually made I tried to compile a mini glossary of websites that educators could visit and those whom definitely for sure they don't have that interest and normally I take along my memory stick* (6:373 (45)).

Respondent seven indicated that the teachers who avoided integrating ICT where elderly teachers: *The only problem is especially with the elderly staff members you know that are scared of the computer* (7:246 (77)). I conclude that this respondent accepted that mature teachers were not going to change and that the respondent was not going to influence them anymore: *… the more you tell them you cannot break the computer the less they are interested in learning. But that is can I say one other pity* (7:246 (77)). The ironic fact was that the respondent also adhered to the description of mature teacher: … *I am an old teacher I've been teaching for thirty-seven years* (7:286 (81)), and kept on referring to mature teachers as: *elderly staff* (7:247 (77)), *older teachers* (7:287 (230)) and *oldies* (7:288 (198)).

Respondent five indicated that it remained a challenge for all teachers to become ICT literate: *Then it gives us a challenge each and each and every teacher must be computer literate …* (5:332 (45)), but he remained positive: *Schools do not change their minds on computers they are going to stay behind and in the past but computers are there to stay, it is a new innovation which is going to be great* (5:348 (61)). When I asked if there were any teachers at his school who were not interested in becoming ICT literate, he answered: *Fortunately at this school no. Quite a number of teachers are skilled* (5:391 (129)) and *those who are not particularly interested those are the ones who tried to make a statement sometime they have applied for a post somewhere else* (5:381 (133)).

Respondents five, six and seven indicated that they were knowledgeable about ICT-related developments:
- *Initially we do have workshops early in the year about computers but in the meantime we have some programmes from the NGOs we, like for instance let's say Damelin this service provider who initially sold its products through correspondence* (*5:334 (49*))
- *We are quite aware number one that the curriculum is changing …* (6:369 (41))
- *Gauteng online is one of the projects that is run by the Provincial Department theyare using stage by stage implementation so probably they have come up to implement, it is one of the projects within our school* (6:399 (109))
- *Luckily I'm doing this incognito so I can say that their programmers are not up to standard and the people offering the courses are not up to standard* (7:290 (262)).

I established that the respondents who were positive about ICT, were also knowledgeable on ICT-related issues. This relates to what I have established during the literature review that

indicates that for continuous change in education, it is essential for principals to regularly update their own ICT knowledge and skills to facilitate appropriate change (Gibson, 2002, pp. 321 - 322; Han, 2002, p. 295).

4.2.3 Conclusion

The first sub-question related to the principals' leadership and management styles. The principals' perceptions on how they manage and lead their schools, provide an indication of how they perceive their role in the integration of ICT for teaching and learning. My data indicate that principals have the capacity to lead and manage ICT integration effectively. However, this in not the case in many schools.

The second part of the question aimed to determine if there was any relationship with the principals' attitudes towards ICT integration and the influence they have on teachers' ICT integration. By means of inductive analysis of my interview data, I identified it is not only the principals' actions that have an influence but also their attitudes. The following factors of the principals' attitudes were identified as having an influence on teachers' effective ICT integration:

• General comments made by principals
• Gaining of knowledge
• Content of phraseology when talking about ICT integration.

These three factors are an indication of principals' attitudes towards ICT integration. If teachers encountered these in daily conversation with their principals, they will either be positively or negatively influenced on the use of ICT in teaching and learning. Therefore, principals should be aware of how they express themselves when talking about ICT integration as teachers pick up on their attitudes towards the use of ICT.

4.3 How does principal's strategic thinking of teacher professional development influence Information and Communication Technology integration?

The DoE (2004, p. 11) has initiated several TPD initiatives to train teachers in ICT literacy. To date no training for the intermediate and advanced levels dealing with the integration of ICT in the curriculum has taken place. In Gauteng, the focus is on the acquisition and upgrading of ICT infrastructure and facilities (DoE, 2005, pp. 8, 14). The pace at which the

DoE is facilitating the integration is slow. This has led schools to become idle and caused principals negative attitude towards the DoE initiative of TPD for ICT:

- *… what is still keeping us back is the Gauteng Online story* [69] *(1:751 (25))*
- *… if you are going to wait for their training I think it might still take a few years so it is just a question … you know you have to be there and you make a plan to get there* [70] *(1:753 (77))*
- *Then currently they are building the third one the Gauteng Online but that is the one they are still busy (6:431 (17))*
- *But for the lower-level educators since we had the training of the thirty we haven't yet taken them from that beginner lesson to a greatly advanced level (6:437 (177))*
- *… we have Gauteng online and e-learning and all that stuff but unfortunately they came and they installed it and then there is no signal for it they trying to fix things like that (7:295 (250)).*

Respondents indicated that they have taken matters in their own hands, and have provided in-house TPD for ICT integration:

- *I must say we handle our own training* [71] *(1:749 (73))*
- *At this stage we do it ourselves. The Department is not able to do it, not on such a big scale. No, I think we have to take our own initiatives* [72] *(3:698 (136))*
- *… we offer courses you know at the end of the year (7:291 (142))*
- *… there can come a lot more from the Department's side but just like a lot of other stuff in education if you are serious about it and you don't drive it, it will not take place* [73] *(8:297 81))*
- *Initially we do have workshops early in the year about computers (5:402 (49)).*

Respondents indicated that the DoE training is below the current competencies of teachers at their schools:

- *... the training they give is very basic and I think that our people have already done that, we have gone a step higher* [74] *(1:52 (77))*
- *… the courses that they give are of poor quality or they waste people's time, or it takes place at a funny time or it is poorly organised so I am not really interested in their stuff* [75] *(4:433(85))*
- *… one that did happen in 2005 we had three workshops that we ran through the four packages of Microsoft Office then from that one I think the follow-up lesson was done by Schoolnet with thirty educators the challenge is out of that thirty you will only find five or six of them are actually utilizing … using it (6:436 (157))*
- *Luckily I'm doing this incognito so I can say that their programmers are not up to standard and the people offering the courses are not up to standard (7:290:(262)).*

Most of the respondents agreed the DoE current TPD initiatives and strategies are not effective in aiding the process of effective and sustainable ICT integration in their schools. Principals have to plan strategically about their current ICT integration situation (Figure 4.4).

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[69] *… wat ons nog terug hou, jy weet, is hierdie Gauteng Online storie*

[70] *… as jy gaan wag vir hulle opleiding dink ek gaan dit dalk jare vat, so dit is maar net 'n kwessie van as jy weet jy moet daar wees moet jy plan maak om daar te kom*

[71] *Maar ek moet sê ons hanteer ons eie opleiding*

[72] *Op hierdie stadium is dit maar onsself wat dit doen. Die department is nog nie regtig gerat om dit te kan doen nie, nie op so 'n skaal nie. Nee, ek dink ons moet maar self die inisiatiewe neem*

[73] *… daar kan baie meer van die department se kant af kom, maar soos soveel ander goed in die onderwys as jy ernstig daaroor is en jy dryf dit nie dan gaan dit nie gebeur nie*

[74] *… die opleiding wat hulle gee is geweldig basies en ek dink ons mense is al daar verby, ons is al 'n trappie hoër*

[75] *… die kursusse wat hulle in elk geval aanbied is van swak gehalte of hulle mors die ouens se tyd, of dit is op 'n snaakse tyd of dit is swak gereël so ek stel nie regtig belang in hulle goed nie*

It is essential for the principal to think strategically about TPD strategies for effective ICT integration.

Funding, time and manpower is used ineffectively without any determined attempts at assisting teachers with their ICT integration (Seyoum, 2004, p. 5; Thorburn, 2004, p. 7). Figure 4.4 indicates the importance of strategic planning as it provides direction and assists the principal in determining appropriate strategies required for effective and sustainable ICT integration. Davies and Davies (2005, pp. 10 - 13) point out that strategic leadership is the critical characteristic of effective school development. Strategic principals provide direction and compile a framework of the future requirements of the organisation. The function of the strategy is to translate the school's vision into reality and provide direction through a proactive transformational mindset.
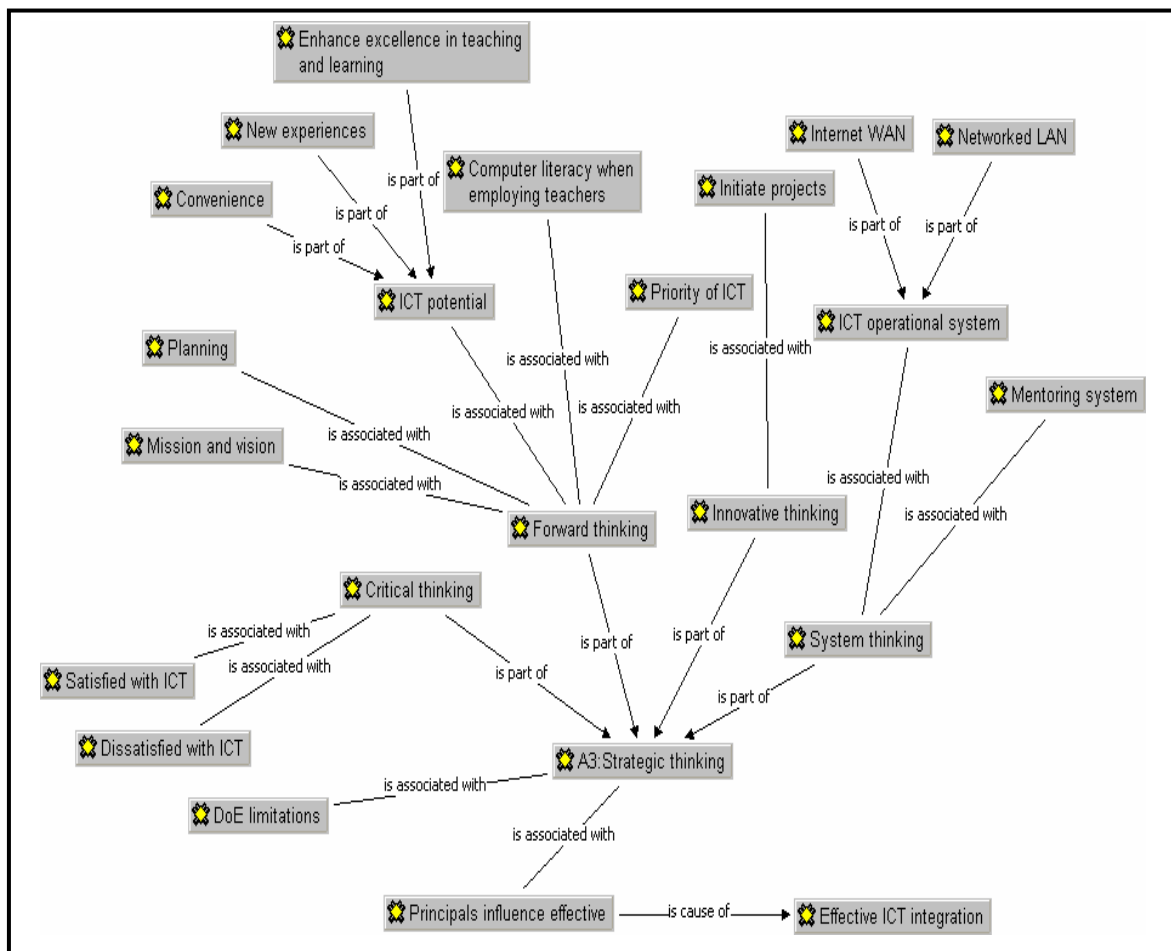
Figure 4.4   Principal's strategic thinking as an influential factor

Without the principal's interest, enthusiasm and understanding, the school will not be strategically focused (Davies & Davies, 2005, p. 23). Everard, Morris and Wilson (2004, p. xii) indicate that strategic thinking consists of: innovative, critical reflective, systems and forward thinking that forms a fundamental component of excellence in leadership. Principals'

strategic thinking establishes the fundamental elements for effective TPD for ICT integration. Figure 4.4 indicates the codes that are related with strategic thinking: critical, forward, innovative and system thinking.

4.3.1 Critical thinking

Effective principals assess current situations and resources, monitor the impact of TPD programmes to make informed decisions, and plan ahead for improved teaching and learning (Arnold et al., 2006, p. 3; Scrimshaw, 2004, p. 5). I asked the respondents if they were satisfied with the scope and level of ICT integration. Four respondents indicated they were not entirely satisfied:

- *No* [76] (8:202 (25)). *Just the fact it is not sufficiently available* [77] (8:204 (29))
- *I think a person can do more. A person sits there with the older members who are not really clued up on that* [78] (4:438 (37))
- *I would say yes on a small scale I'm satisfied but I would like more teachers to acquire more skills related to computer preparation* (5:329 (37))
- *I'm not yet happy because if I visit other schools whom I know that we started at the same time you can really see the leap that they already that they two or three years ahead of us when we were the first schools who were to develop the projects* (6:380 (61)).

However, two respondents were satisfied with their current progress towards ICT integration that would enhance teaching and learning, and they indicated:

- *Yes, absolutely, at the moment there is an atmosphere at school that you are supposed to teach this way* [79] (1:699 (29))
- *Yes, I think we are busy, I have just constituted a committee of teachers, all the heads of subjects had to go and do research on what is available in their subjects* [80] (3:533 (29)).

From my observations' my field notes and the respondents' comments on their satisfaction of ICT integration, I noted that the respondents' perception of ICT integration varied. A respondent commented on her satisfaction, but also referred to her learners' computer literacy:

- *Yes, we offer ICT as part of a technology even in grade … or part of IT I shouldn't say IT I should say we offer basic computer literacy as a part of technology even in grade eight* (7:297 (33)).

4.3.2 Forward thinking

Clarke (2007, p. 2), Foskett and Lumby (2003, p. 122), indicate that an important component for effective and successful leadership is that principals should institutionalise and

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[76] *Nee*

[77] *Net bloot omdat dit nie beskikbaar genoeg is nie*

[78] *Ag, ek dink 'n mens kan dit nog meer doen. 'n Ou sit maar daar bietjie met die ouer mense wat nie regtig … hulle is nie regtig so "opgeclue" daaroor nie*

[79] *Ja, absoluut en op die oomblik wil ek vir jou sê hier is 'n atmosfeer in die skool van dat jy maar veronderstel is om so skool te hou*

[80] *Ja, ek dink ons is besig, ek het juis nou 'n komitee saamgestel van personeel, al die vakhoofde wat vir my moes gaan navorsing doen in hulle vak wat is beskikbaar, ensovoorts*

communicate a clear attainable vision. It promotes and assists in various actions to enhance and sustain effective teaching and learning, as well as creating direction and purpose for future success. Bush (2003, pp. 6 - 7), Wallace and Poulson (2003, pp. 220 - 222), Tomlinson (2004, pp. 143 - 144), Spurr, Rosanowski and Williams (2003, p. 3), Arnold, Perry, Watson, Minatra and Schwartz (2006, p. 2), Berube, Gaston and Stepans (2004, p. 2), Young, Sheets and Knight (2005, p. 25) all state the requirement of a vision that assists, attains aims and objectives, paves the way for TPD to take place, establishes excellence, allows change to take place by making use of available skills, talents and resources, and ensures that management activities and actions that are purposeful and functional. All the respondents had some sort of a mission or vision towards future ICT integration:

- *… you see the mission of the school is actually very important, if there is something of excellence in teaching, such things in your vision and you don't address the IT issue then you are lying to yourself* [81] (1:754 (137))
- *Well in the future if it is financially viable to supply as many classrooms as possible with computers, internet and projectors* [82] (8:298 (57))
- *Well we would like to have a laptop in every classroom as well as a plasma screen, for every subject we would like to have the software that will help us even if we have to help with the development and we would like every teacher to be able to use it* [83] (3:700 (37))
- *… every classroom has its own computer and all are linked to a network. I am telling you that is what a guy wants, we are already working on that* [84] (4:437 (161))
- *… we look at is each and every educator in the school must be computer literate* (5:404 (45))
- *… to make sure that we really understand that when people are into the computer lab it is not to say to type, it is about the integration of that information within the learning area that they are working with especially from the side of the educators* (6:439 (217))
- *To use technology* (7:296 (45)).

Nolan, Friesen, Maeers, Couros (2005, pp. 2 - 4) point out that the goal should ultimately be that teachers make use of ICTs' full potential by integrating it effectively in their teaching and learning practices to the benefit of the learners. Hezel Associates (2005-2006, pp. 2 - 4) indicate that principals have significant responsibilities when it comes to initiating, organising, planning and implementing TPD in their schools, especially through creating in-house training opportunities. Planning is necessary to ensure an effective and efficient school (Clarke, 2007, p. 3). This strategic thinking process gives principals the opportunity to plan what strategies can be applied in their schools to create effective TPD opportunities for teachers integrating ICT into their existing teaching practices. Scimshaw (2004, p. 15), Conole (2004, p. 4), DoE (2005, p. 25), Seyoum (2004, p. 2), Noland, Friesen, Maeers and

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[81] *… jy sien die missie van die skool is eintlik verskriklik belangrik, as daar iets is van uitnemende onderrig, sulke goed in jou visie en jy spreek nie die IT ding aan nie dan is jy besig om vir jouself te lieg*

[82] *Wel in die toekoms om indien effektief koste moontlik is vir soveel as moontlik klasse moontlik rekenaars, internet en projektors te gee*

[83] *Wel ons sal graag in elke klas sal ons graag 'n laptop wil hê, ons sal in elke klas graag 'n plasmaskerm wil hê, ons wil vir elke vak wil ons graag die sagteware wil hê wat ons kan help daarmee al moet ons dan nou maar self daarmee help met die ontwikkeling daarvan en ons sal graag wil hê dat elke personeel in ons skool moet dit kan toepas*

[84] *… elke klaskamer het hulle 'n rekenaar en almal moet gekoppel wees op 'n netwerk, ek sê vir jou, dis wat 'n ou wil hê, ons werk nou al daaraan*

Couros (2005, p. 2), Jimoyiannis and Komis (2007, p. 169), Thorburn (2004, p. 1) Selwyn (2002, p. 28) accentuate the fact that the planning of ICT integration in education is now a complex and demanding challenge, opportunity, risk as well as a necessity.

Respondents indicated that they plan for TPD activities as well as ICT resources necessary for ICT integration (Table 4.3). Most of the respondents pointed out that they could budget annually for appropriate and required ICT as well as TPD activities.

Table 4.3   Planning of TPD activities and ICT resources

TPD	ICT
• *We did a survey this morning among the teachers in terms of training to specifically make use of it* [85] (1:684 (9)) • *… we have a special budget for TPD* [86] (3:568 (45)) • *… in the budget you make provision for it, we look at what we can get if there are courses or maybe you can get a speaker …* [87] (4:372 (137)) • *Each year, yes, we do make a budget necessary for that* (5:358 (81)) • *… we offer courses, you know, at the end of the year* (7:254 (142))	• *… that has to be in the budget it is non-negotiable* [88] (1:677 (13)) • *… every year there is a big budget for computer and technology advancement for the school* [89] (3:675 (181)) • *…a person builds it into his budget …* [90] (4:399 (201)) • *Although the budget is not going to be enough that is when we go out and purchase computers to supplement that what we have…* (5:405 (81)) • *I've made that it is a requisition that through the staff development to buy for them the memory sticks* (6:413 (169)) • *I've got quotations on my table that I want to discuss with the SGB tonight because we need more computers* (7:249 101))

Although two respondents indicated the importance of establishing TPD, they made no plans for any TPD activities to take place:

• *… if you are serious about it and you don't drive it, it will not take place* [91] *(8:298 (81))*

• *I think it is the school because we have to definitely for sure create a particular culture, we don't have to put the responsibility or the liability because at the end we are the ones who produce, who are expected to the production so that we make it work easier and quite effective in terms of how do we really function (6:440(61)).*

One respondent gave no clear indication of planning for acquiring any ICT resources due to insufficient funding:

• *…it is a problem that it is not so attainable and achieved* [92] (8:210 (13)).

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[85] *Ons het vanoggend 'n opname weer onder die personeel gemaak in terme van opleiding om dit spesifiek te gebruik*

[86] *… ons het 'n spesiale begroting vir personeel opleiding*

[87] *… ou se begroting maak jy darem voorsiening vir dit, ons kyk maar wat 'n ou kan kry as daar kursusse is of jy dalk 'n spreker of 'n ding kan kry…*

[88] *… daai moet in die begroting wees, dit is on-onderhandelbaar*

[89] *… daar jaarliks groot begroting gaan op die rekenaar en die tegnologiese vooruitgang van die skool*

[90] *… n mens bou dit in jou begroting in…*

[91] *… as jy ernstig daaroor is en jy dryf dit nie dan gaan dit nie gebeur nie*

[92] *… dit is 'n probleem dat dit nie so beskikbaar en bereik is nie*

Principals' prioritisation of ICT integration and how they predicted the future would impact on ICT on teaching and learning has a determining influence on the strategies they will implement for TPD and to what lengths they will go to implement the strategies. Most of the respondents indicated the importance of ICT integration:

- *… you have to use ICT in your classroom teaching, you cannot go without it any longer* [93] (1:624 (13))
- *We are now busy earnestly, this is now from this year onwards to put everything in this type of ICT* [94] (3:590 (57))
- *Make it a point that the computers are incorporated in class and curriculum* (5:336 (53))
- *Especially at this rate that which the education is changing definitely for sure everybody needs to have it* (6:368 (41))
- *I mean I can't teach the way I used to teach when I started teaching and ja you just got to keep up with it* (7:274 (214)).

Two respondents contradicted themselves on their priority of ICT integration. On the question whether it was important that teachers make use of ICT and are knowledgeable about ICT respondent two stated: *It is non-negotiable* [95] (8:196 (9:9)). As the interview proceeded, I realised that ICT integration was not 'non-negotiable' because the respondent *… postponed it for a year* [96] (8:250 (101)) and stated: *I would like to do it but it is totally unpractical* [97] (8:245 (97)).

Respondent four maintained: *I don't think you can do really without computers at this stage. I don't think you can really be without it. You are in the Stone Age if you work without it* [98] (4:304 (29)). *No, never ever. A person can not work without those things, you are dead if you do* [99] (4:406 (229)). However, this respondent contradicted himself as well by stating: *…I think a person can give effective teaching without a computer. You don't really need a computer* [100] (4:325 (53)).

All respondents acknowledged that ICT has enormous potential for education, and that it is important for achieving excellence in teaching and learning. During the interviews various factors emerged, indicating the respondents' perceptions of this potential (Table 4.4). They indicated that ICT was convenient, enhanced teaching and learning, provided excellent resources and offered new experiences for teachers as well as learners.

Table 4.4   ICT potential

Convenience	Resources	New experiences	Enhances teaching and learning
• … the application of technology just	• … with this stuff there is a vast amount of	• … she can sit here in class, the computer screen is on in the other class and	• … I think if you experience the learners are

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[93] *Moet hierdie tegnologie in jou klasaanbieding aanwend en kan nie meer daar sonder nie*

[94] *Ons is nou besig om ernstig, dit is nou van hierdie jaar af alles in hierdie tipe van tegnologie te sit*

[95] *Dit is on onderhandelbaar*

[96] *… dit vir 'n jaar uitgestel*

[97] *… ek sou dit graag wou doen maar dit is totaal en al onprakties*

[98] *Ek dink nie jy kan regtig daarsonder nie. Jy is in die Steentydperk as jy daarsonder werk*

[99] *Nee, nooit never nie. 'n Ou kan nie sonder daai goed werk nie, jy is dood as jy dit doen*

[100] *… ek dink 'n mens kan effektief onderrig gee sonder 'n rekenaar. Jy het nie regtig 'n rekenaar nodig nie*

Table 4.4   ICT potential

Convenience	Resources	New experiences	Enhances teaching and learning
makes life easier [101] (1:647 (33)) • *It is a question that you just press a button and everything is done* [102] (3:663 (156)) • *It is very time effective …* [103] (4:306 (29)) • *… it will make the work of the teachers very very easy and for quite a lot of things we will be using the computer* (5:350 (65)) • *… teachers, work can be updated quite easily* (6:411 (165)) • *Anything at any given time you can ask me of any learner and I can look in the computer* (7:237 (13))	*knowledge currently, that is available on the Internet* [104] (4:332 (69)) • *… also searching information* (6:412 (165)) • *… we have this topic that we are busy with we are looking for this information, in the meantime get the web connections* [105] (8:287 (37)) • *We got Internet facilities for all learners. I think in today's life you can't go without a computer* (7:281 (45)) • *… prepare to share some of the information through the memory stick it actually tells you that we have moved a long way* (6:423 (101))	*she can quickly explain this thing and they can see, the learners see everything on the screen and the teacher sees it…* [106] (3:631 (96)) • *In the meantime we have contacted the American Embassy and we have a liaison programme with two schools in America via the Internet which the learners benefit more from …*[107] (8:227 (37)) • *If you enjoy teaching again and you have all the learners' attention and everybody behaves; that is pleasant for the teacher* [108] (1:736 (101)) • *… gives you a chance to always try something new and innovative in a way it grabs the educators, a chance to become empowered in terms of the content that it* teaches (6:424 (165)) • *… click on this thing there are all seven from which one do we want more of and I mean this is part of OBE stuff and you show the learners what is going on with this stuff* [109] (4:416 (165))	*paying attention this is now nice, it's quiet in your class and there is intelligent questions the learners are riveted to this …* [110] (1:735 (101)) • *… how does the cross section of this leaf look like, click on Oxford University www and there it is, in glorious colour* [111] (4:415 (165)) • *… if each teacher could have a laptop they could present their classes so much more efficiently with PowerPoint* (7:283 (53))

Most respondents agreed that knowledge about and to be skilled in ICT are the determining factors when employing or promoting teachers:

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[101] *… so die aanwending van die tegnologie maak net die lewe vir 'n ou makliker*

[102] *Dit is 'n kwessie van jy druk 'n knoppie en alles is klaar*

[103] *Dit is baie tyd effektief …*

[104] *… en met hierdie goeters daar is so legio van kennis wat daar tans is, is in die Internet*

[105] *…ons het hierdie onderwerp wat ons hanteer ons soek hierdie inligting, kry solank vir ons die webskakels*

[106] *…kan sy hier in haar klas sit, die rekenaarskerm is aan in die ander klas en sy kan gou hierdie ding verduidelik en hulle kan sien, die kinders sien alles op die skerm en die personeellid sien dit…*

[107] *Nou het ons intussen tyd met die Amerikaanse ambassade kontak gemaak en ons het 'n skakelprogram wat die kinders eintlik meer uit baat met twee skole in Amerika wat via internet gebeur…*

[108] *As jy weer lekker skool hou, en jy het al die kinders se aandag en almal let op, almal gedra hulle en dis heerlik vir 'n onderwyser*

[109] *…kliek op die ding daar is al sewe van watter een wil ons meer hê en ek bedoel dit is deel van die OBE goeters en jy wys vir die kinders wat gaan aan met hierdie goed*

[110] *… ek dink as jy ervaar die kinders wat oplet dit is nou lekker stil in jou klas en dis intelligente vrae die kinders sit vasgenael vir hierdie goed*

[111] *… hoe lyk die deursnit van hierdie blaar kliek op Oxford Universiteit.www woeps daar lê die ding mooi in kleur wys*

- *… you must be computer literate that is one of the criteria. Even when it comes to our promotions you have to be computer literate if you want to apply for a promotion post here by us* [112] (3:669 (172))
- *… we advertise the post for the teacher who is computer literate* (5:339 (53))
- *You cannot just employ anybody who does not know anything about computers* (5:380 (121))
- *I would ask people whether they are computer literate. I did it in our previous interviews…* (7:273 (206))
- *… there is a whole section on administration and computer literacy, computer training and computer application, are the three questions asked* [113] (8:243 (89)).

4.3.3 Innovative thinking

Many principals found themselves in an environment where financial resources are not readily available. They perceived this as hampering the successful integration of ICT. Principals become creative about generating additional funding. Drago-Severson (2004, pp. 53 - 54) states that insufficient resources negatively impact on teachers' learning and teaching as it determines the frequency, quality and the number of teachers that can undergo TPD. Seyoum (2004, p. 1) and Walsh (2002, p. 19) add that with continuous technological advancements and limited financial resources, principals have to generate sufficient funding for effective and sustainable ICT integration and ICT infrastructure.

- *… it is just a question that you know you have to be there and you have to make a plan to get there* [114] (1:696 (77))
- *We have, for example , the specific institution that is coming to give us a presentation, it is going to sponsor us, and a lot of this stuff they are going to give to us* [115] (3:610 (73))
- *… every year we approach the corporate world, the business to sponsor our staff development workshops* (5:342 (57))
- *… we actually approached Telkom Foundation to come and install the computers* (6:403 (117))
- *Fundraises and parents, you don't really get from parents. Fundraises we offered last Saturday we offered a departmental function where we did the catering and obviously there is a bit of money left from catering* (7:251 (109)).

All respondents indicated that creativity in generating funding for TPD was often required. When referring to my field notes, I noted that two of the respondents' comments indicated limitations to their initiatives:

- *… said the school does not really have money for this stuff you have to build it, then you jump in and you build it, you plan it yourself* [116] (4:410 (237)).

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[112] *... hy moet rekenaargeletterd wees, dit is een van die kriteria. Selfs by ons bevorderingsposte; jy moet rekenaargeletterd wees as jy wil aansoek doen vir 'n bevorderingspos by ons*

[113] *… daar is 'n hele afdeling oor administrasie en rekenaargeletterdheid, rekenaaropleiding en rekenaartoepassing, is drie spesifieke vrae wat gevra word*

[114] *… dit is maar net 'n kwessie van as jy weet jy moet daar wees moet jy plan maak om daar te kom*

[115] *Ons het byvoorbeeld, die spesifieke plek wat ons nou hierdie aanbieding kom doen, kom ons borg, en baie van hierdie goeters gaan hulle vir ons gratis gee*

[116] *…gesê die skool het regtig nie geld vir die goed nie jy moet maar daai goed bou, jy klim maar in en jy bou maar self, jy maak maar self 'n plan*

This comment referred to a respondent's previous school where he initiated a project — this was an indication to me that you can plan as necessary. Currently this principal has not initiated any projects to generate additional funding.

The second respondent's project was small. They had only received five Internet-connected computers, which indicated that only a few privileged teachers could receive training in searching for information on the Internet:

- *… the American Embassy has installed an ADSL line and has given us five computers with a bit of training about research and so on* [117] *(8:299 (37)).*

4.3.4 System thinking

Functional technological infrastructure and facilities should be available before teachers can integrate ICT on a regular basis in teaching and learning activities (Becta ICT Research, 2004, p. 3; Cowie & Jones, 2005, p. 10; Gibson & Oberg, 1999, p. 2; Han, 2002, p. 296; Means, 1994, p. 177; Seyoum, 2004, p. 2). Table 4.5 indicates the scope and extent that principals in this study make ICT operational systems, as well as mentoring systems, available to teachers at their schools. Both these systems are of the utmost importance for effective and efficient integration of ICT in teaching and learning.

Table 4.5   Availability of ICT operational system and mentoring system

ICT operational system		Mentor system
Internet WAN	**Networked LAN**	
Respondent 1:		
• *When a learner comes and does research or wants information it is in electronic format* [118] *(1:698 (133))*	• *… the Smart System this is the school's administrative system* [119] *(1:614 (5))*	• *… we have pace setters for every subject and phase …* [120] *(1:643 (53))*
Respondent 2:		
• *… try and get more information from the computers especially the Internet* [121] *(8:199 (13))*	• *… we use it fully for the school's admin, research and information* [122] *(8:194 (5))*	• *Not really formally …*[123] *(8:259 (117))*
Respondent 3:		
• *In the four computer centrums Internet is available* [124] *(3:684 (216))*	• *… everyone has a computer linked to the network* [125] *(3:653 (136))*	• *The moment when a teacher comes in then a mentor is assigned, usually the subject*

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[117] *…die Amerikaanse ambassade het nou vir ons 'n ADSL-lyn ingesit.Hulle het vir ons vyf rekenaars gegee, bietjie opleiding gegee rondom die navorsing en die goed*

[118] *As 'n kind kom navorsing doen of inligting wil hê moet dit in elektroniese formaat*

[119] *…die smart stelsel dis nou die skool se adminastratiewe stelsel*

[120] *… ons het pasaangeërs nou maar vir elke vak en fase …*

[121] *… meer inligting vanaf die rekenaar te probeer kry, veral die internet*

[122] *… ons gebruik hom volledig vir skool administrasie, navorsing, inligting*

[123] *Nie regtig formeel nie…*

Table 4.5   **Availability of ICT operational system and mentoring system**

ICT operational system		Mentor system
Internet WAN	**Networked LAN**	
		head… [126] *(3:672 (176))*
Respondent 4:		
• *… there is Internet we have ADSL lines* [127] *(4:310 (165))* • We obviously have a Internet café [128] *(4:443 (177))*	• *… over the hundred computers that are on the network* [129] *(4:390 (165))*	• *Yes we do use the tutor or mentor system …* [130] *(4:383 (117))*
Respondent 5:		
• *No, not yet. It is something that we are looking at. We are looking at the Internet too but the rural area the matter is with Telkom now … (5:387(173))*	• *… administrative purposes for say for instance if you want to check the payment for school fees of the learners I do use the computer, for some time tables for learners I also check the computer and learners progress, progress register in the computer maybe comparing the marks (5:322 (33))*	• *Usually the senior teachers, teachers who have been in the teaching profession for some time who understand and who has the experience of what teaching entails and who can also be able to assist the person with educational matters (5:385 (145))*
Respondent 6:		
• *With Gauteng online I believe it will be our first experience with the connection with the Internet (6:408(153))*	• *…haven't yet synchronized in such a way that we be able to find information that based on administration from the individual computers… (6:362 (25))*	• *Ag, we introduced the concept but we did not implement it properly, we are not implementing it properly here (6:414 (193))*
Respondent 7:		
• *We got Internet facilities (7:283 (45))*	• *We make use of computers for all admin, marks, mark sheets, absentees all the financial matters basically everything. Anything at any given time you can ask me of any learner and I can look in the computer (7:236 (13))*	• *Each new teacher is allocated to one of the oldies (7:271 (198))*

The shaded areas in Table 4.5 indicate the absence of availability of infrastructural and mentoring systems. Only two respondents did not have ICT operational system available relating to Internet connection. All respondents reported that the computers in the administrative block were connected to a local area network except for one. Some had

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[124] *In die vier sentrums is daar Internet*

[125] *… elkeen het 'n rekenaar wat gekoppel is aan 'n netwerk*

[126] *Die oomblik as 'n personeellid inkom dan word daar 'n mentor, dit is gewoonlik die vakhoof …*

[127] *…daar is Internet ons het ADSL lyne*

[128] *Ons het natuurlik 'n Internet kafee*

[129] *… oor die honderd rekenaars wat op 'n netwerk*

[130] *Ja ons gebruik maar die teoter of mentor stelsel…*

additional computers that were also connected to the local area network. The learners, as well as teachers had access to the Internet. Two respondents had no formal mentoring system at their schools.

4.3.5 Limited strategic thinking

The data analysis indicated that respondents showed limited strategic thinking. The categories illustrate the limitations (Figure 4.5).
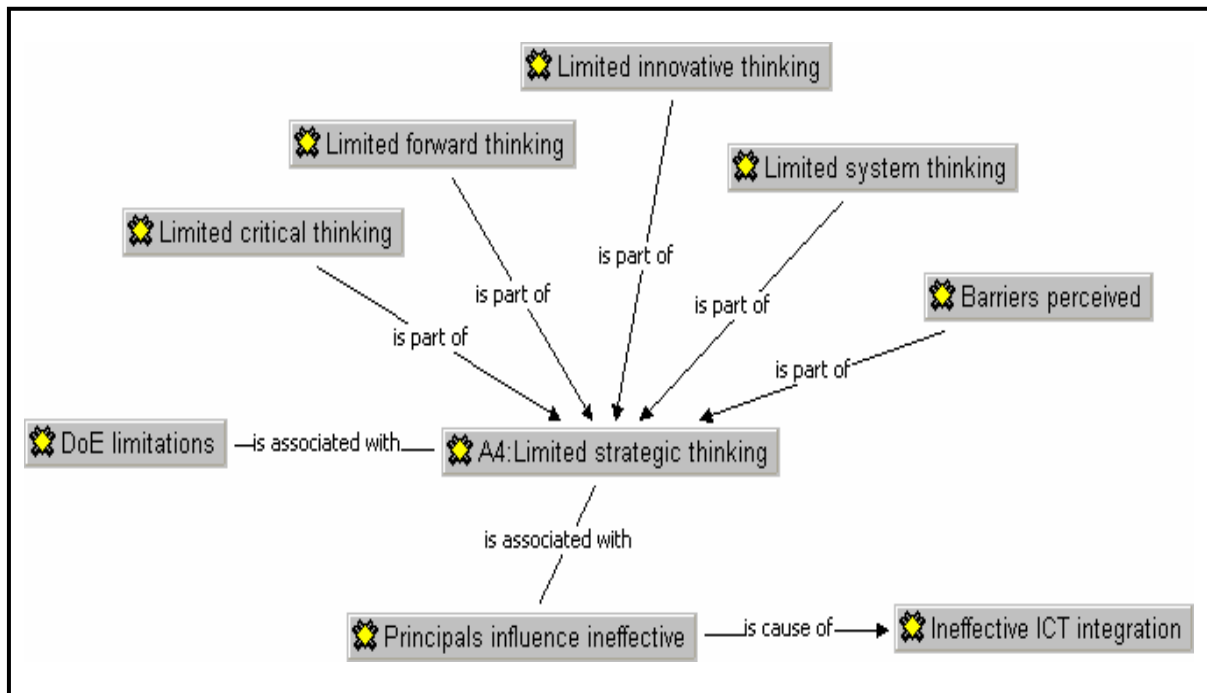
Figure 4.5   Indication of principals' limited strategic thinking

Limited strategic thinking is associated with ineffective leadership by principals for ICT integration (Figure 4.5). Respondents indicated their limitations on strategic thinking. Respondent two did not adhere to any of the types of effective strategic thinking (Table 4.6).

Table 4.6   Respondent 2: Principal's limited strategic thinking

Critical thinking	Forward thinking	Innovative thinking	System thinking	Barriers perceived
• *I would like to do it but it is totally impracticable* [131] *(8:248 (97))* • *… but it is not a formal aspect that is formally driven* [132] *(8:216 (33))*	• *… the programme must then be more subject-driven …* [135] *(8:213 (17))*	• *… it is financially not viable in our school* [137] *(8:301 (29))* • *..bit of training in*	• *… the five computers that are specifically connected to the Internet* [139] *(8:230 (41))*	• *…finances and security I almost want to say are the two biggest stumbling-blocks* [142] *(8:249 (101))*

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[131] *Ek sou dit graag wou doen maar dit is totaal en al onprakties*
[132] *…maar dit is nie 'n formele aspek wat formeel gedryf word nie*

Table 4.6 Respondent 2: Principal's limited strategic thinking

Critical thinking	Forward thinking	Innovative thinking	System thinking	Barriers perceived
• …it is just a lack of exposure [133] (8:302 (109)) • … unfortunately once again availability plays an important role [134] (8:303 (129))	• …the whole security situation is once again going to put off some guys to use it [136] (8:304 (129))	regard to research [138] (8:221:(37))	• No, we have a computer-typing centre [140] (8:300 (41)) • …it is mostly for learners [141] (8:231 (41))	• … established ideas or a lack of, or resistance against change is possibly the big thing [143] (8:261 (121))

From the field notes it became apparent that respondent two focused on the barriers of integrating ICT into teaching and learning. He constantly blamed the barriers for not integrating ICT. He also did not think of planning ahead, or strategising to overcome his perceived barriers. The barriers seemed to hamper his strategic thinking and planning:

- *I presume you are now going to ask me what the barriers are, so it is a problem that these are not available and achievable…*[144] (8:323 (13))
- *With us finances are a crisis, just now I wanted to refer to the barriers, but a few things, the availability of computers and the security around computers…*[145] (8:204 (29))
- *… not financially attainable in our school's framework to give every teacher a computer or to have available or even to have enough laptops and projectors to use it meaningful* [146] (8:311 (29))
- *…finances and security I almost want to say are the two biggest stumbling-blocks* [147] (8:249 (101))
- *… established ideas or a lack of, or resistance against change is possible the big thing* [148] (8:261 (121)).

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[133] *…dit is bloot 'n gebrek aan blootstelling*
[134] *…ongelukkig weereens speel beskikbaarheid 'n geweldige rol*
[135] *…die progam moet dan meer eintlik vakgedrewe wees*
[136] *…die hele veiligheidsituasie gaan party ouens nou weer afsit om dit te gebruik*
[137] *…nie finansieel haalbaar binne ons skool*
[138] *… bietjie opleiding gegee rondom die navorsing*
[139] *… die vyf rekenaars is wat spesifiek met die internet gekoppel is*
[140] *Nee, ons het 'n rekenaartiksentrum*
[141] *…dit is hoofsaaklik vir leerlinge*
[142] *…finansies en sekuriteit wil ek amper sê is die twee grootste struikelblokke*
[143] *… gevestigde idees of 'n gebrek aan, of teenkanting vir verandering is waarskynlik die groot ding*
[144] *Ek neem aan jy gaan netnou vir my vra wat is die barriers, so dit is 'n probleem dat dit nie so beskikbaar en bereik is nie…*
[145] *By ons is finansies 'n krisis ek wou nou-nou al na die barrier verwys het, maar 'n paar goed, die beskikbaarheid van rekenaars en die veiligheid rondom rekenaars*
[146] *…nie finansieel haalbaar binne ons skool se opset om vir elke ou 'n rekenaar te gee en beskikbaar te hê of om selfs genoeg draagbare rekenaars en projektors te hê om dit sinvol te gebruik nie*
[147] *…finansies en sekuriteit wil ek amper sê is die twee grootste struikelblokke*
[148] *… gevestigde idees of 'n gebrek aan, of teenkanting vir verandering is waarskynlik die groot ding*

Respondent 4 indicated that he had neglected two types of strategic thinking (Table 4.7).

Table 4.7   Respondent 4: Principal's limited strategic thinking

Critical thinking	Forward thinking	Barriers perceived
• All that we do…[149] (4:380 (141)) • I think a person can do more [150] (4:440 (37)) • No, there are not specific expectations [151] (4:441 (45)) • Yes, I don't think you change those guys [152] (4:364 (125)) • No it is not a prerequisite [153] (4:442 (153))	• We did it …[154] (4:336 (77)) • … there is not really time for it [155] (4:376 (141)) • … but so far this year I left it for this year [156] (4:439 (141)) • …the guys that come to us are all computer literate [157] (4:382 (149))	..frequently we are without telephone lines then they steal the telephone cables …[158] (4:444 (197))

Respondent six indicated two types of strategic thinking that he had neglected (Table 4.8).

He had many perceived barriers to overcome.

Table 4.8   Respondent 6: Principal's limited strategic thinking

Critical thinking	Forward thinking	Barriers perceived
• … those classes who are not doing anything serious maybe typing when they need to do serious work (6:422 (261)) • …we kept some of the classes away to make sure that we get the maximum machines working in the centrums (6:441 (261)) • …it is not that easy to slot in time (6:444 (129)) • … they haven't yet seen it in practice (6:445 (133)) • … mostly it will be for those subjects whom clearly want their worked typed (6:452 (257)) • Now I would say it is still a big challenge (6:372 (45)) • No I'll be honest with you, I'm not yet happy (6:380 (61)) • Yes, for now I put it that it that it is still a big challenge (6:429 (73)) • Okay, I think that one is a big challenge (6:430 (89))	I would say those one that did happen in 2005 (6:410 (157))	• …is the issue of security …(6:447 (217)) • …sixty percent of them still stick to the old method (6:446 (141)) • … expected to raise funds on our own and were we draw most of our kids it is from squatter areas (6:451 (229)) • … time that we need to set aside to make sure that we really understand that when people are into the computer lab it is not to say to type it is about the integration of that information within the learning area (6:448 (217))

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[149] *Al wat ons net doen*
[150] *Ag ek dink 'n mens kan dit nog meer doen*
[151] *Nee, daar is nie spesifieke eise nie.*
[152] *Ja ek dink nie jy verander daai ouens nie*
[153] *Nee, dit is nie 'n voorvereiste nie*
[154] *Ons het dit gedoen*
[155] *…daar is nie regtig tyd daarvoor nie*
[156] *… maar vanjaar sover ek het nou die jaar dit gelos*
[157] *… die ouens wat na ons kom is almal rekenaargeletterd*
[158] *…heel dikwels sonder telefoonlyne want dan steel hulle die kabels …*

Respondent six experienced many barriers. However, he viewed them as a challenge. Due to insufficient critical thinking and forward thinking he indicated no actions, plans or strategies to address the challenges. Focused TPD is required to assist him to address the multitude of barriers and improve his strategic thinking.

Although respondent seven demonstrated adequate thinking skills, she indicated only her perceived barriers. This respondent addressed the barriers through her innovative thinking, strategies and actions:

- *Mind change* (7:275 (226))
- *… learners swop the hard drives, the memory, it is quite easy to open it up and take the memory out and put the new memory in* (7:298 (118))
- *We try to raise money…* (7:299 (105)).

4.3.6   Conclusion

Although the DoE has various TPD initiatives in place for the integration of ICT, my data analysis indicated that most of the respondents are negative towards their initiatives. They perceive DoE's attempts to train teachers for the integration of ICT into their teaching practices slow, insufficient regarding continuous and follow-up support. They also question the quality of the training. The success rate of teachers returning from training that integrate ICT into their teaching and learning practices seem to be very low and unsustainable. Some of the respondents took matters into their own hands and initiated in-house training to ensure that their teachers acquire the competencies for ICT integration. However, my data also indicated that principals required thinking strategically about teachers' ICT integration through TPD. Some of the respondents seem to neglect engaging all types of strategic thinking. Some respondents perceived the barriers differently than others in terms of the intensity and frequency. In spite of shared perceptions of the same barriers, some respondents addressed the barriers through creative and appropriate strategies.

The following dynamics emerged from my analysis and indicated the principals' effective leadership for ICT integration:

- Critical thinking: - Determining satisfied and un-satisfied elements
- Forward thinking: - Establishing a mission and/or vision
                                   - Planning ahead for TPD activities and ICT resources
                                   - Acknowledging the potential of ICT and areas where ICT can be effectively applied
                                   - Computer literacy when employing and promoting teachers
                                   - Prioritisation of ICT integration
- Innovative thinking: - Initiate projects

- System thinking: - Establishing efficient and effective ICT operational system as well as a mentoring system.

4.4   What are the enabling strategies that principals can follow to develop and sustain teachers' integration of Information and Communication Technology in teaching and learning?

Several authors share the same opinion that principals' interest and continuous involvement in ICT integration is the key in determining how ICTs will be used in schools by teachers and learners (Busher, 2006, p. 151; Drago-Severson, 2004, p. xxi; Johnson, 2004, p. xvii; Seyoum, 2004, p. 3; Soule, 2003, p. 8; Spurr et al., 2003, p. 3; Tallerico, 2005, p. 100; Zepeda, 1999, p. 14). Gordon (2003, p. 2), Tomlinson (2004, pp. 101 - 102), Blase and Blase (1994, pp. 9 - 10), Cowie and Jones (2005, p. 3) agree that for fundamental change to take place, principals are required to provide appropriate support and ensure conducive working conditions that will positively affect teachers' attitudes, essential for the implementation of change into their teaching and learning practices. Principals should assess the presence of certain conditions in schools and then take appropriate steps to strengthen the conditions that are already present while taking steps to rectify or establish those that are not present in order to facilitate and enhance the integration of ICT in teaching and learning (Nawawi et al., 2005, p. 96). Van der Westhuizen (1997, pp. 191 - 192) indicates that many aspects influence the relationship between a principal and teachers necessary for work satisfaction and overall contentment.

From the literature I derived that certain enabling factors have to be considered to aid the process of effective and sustainable ICT integration. From my analysis I categorised the enabling strategies into three categories: TPD enabling strategies, ICT enabling strategies and teacher enabling strategies essential to be implemented by the principal for effective ICT integration to materialise (Figure 4.6).
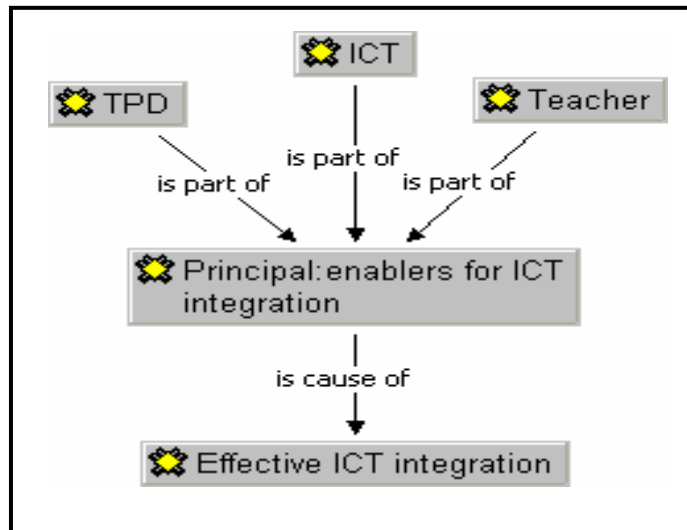
Figure 4.6   Categories for effective ICT integration

My field notes and the respondents' comments relating to the strategies that they put into practice for effective and sustainable ICT integration varied considerably. Some respondents made use of more enabling strategies than others. This observation led me to catalogue all the enabling strategies that the respondents implemented and group them together under the three categories (Figure 4.6) that allowed me to form a comprehensive catalogue of enabling strategies.

4.4.1   Teacher professional development enabling strategies that principals can follow to develop and sustain teachers' integration of Information and Communication Technology in teaching and learning

A way that a principal can provide and sustain supportive contexts for teachers is through TPD as it influences teachers' confidence levels, their inclination toward trying out innovative ideas, as well as their attitude towards the teaching profession and creative classroom practices (Blase & Blase, 1994, p. 67; Center for CSRI, 2007, p. 2; Drago-Severson, 2004, pp. xxi, 38; Tallerico, 2005, p. 123). Hezel Associates (2005-2006, pp. 2 - 4) indicate that principals have significant responsibilities when it comes to initiating, organising, planning and implementing TPD in their schools. Various authors agree that principals have to create opportunities for TPD (Blase & Blase, 2001, pp. 14, 16, 23, 64; Blase & Blase, 1994, p. 9; Han, 2002, p. 295; Thorburn, 2004, p. 9).

Day and Sachs (2004, p. 48) point out that TPD deals with changes that teachers experience in their skills throughout their teaching careers. TPD allows teachers to grow professionally by extending and renewing their knowledge and skills (Arnold et al., 2006, pp. 3 - 4). TPD

creates a supportive environment and principals should encourage and create TPD opportunities were teachers can continuously share their expertise, success, frustrations and knowledge with one another (Blase & Blase, 2001, pp. 14, 16, 23, 64; Blase & Blase, 1994, p. 9; Gibson, 2002, p. 32; Han, 2002, p. 295; Theroux, 2004, p. 3; Thorburn, 2004, p. 9). Clarke (2007, p. 131) emphasises that an effective TPD programme is a critical factor in a school that has to be an integral part of teachers' professional lives. This will ensure continuous improved teaching and learning; contributing to the school's excellence. From the literature, my field notes and analyses the following categories indicating the enabling strategies associated with TPD for effective ICT integration emerged (Figure 4.7).
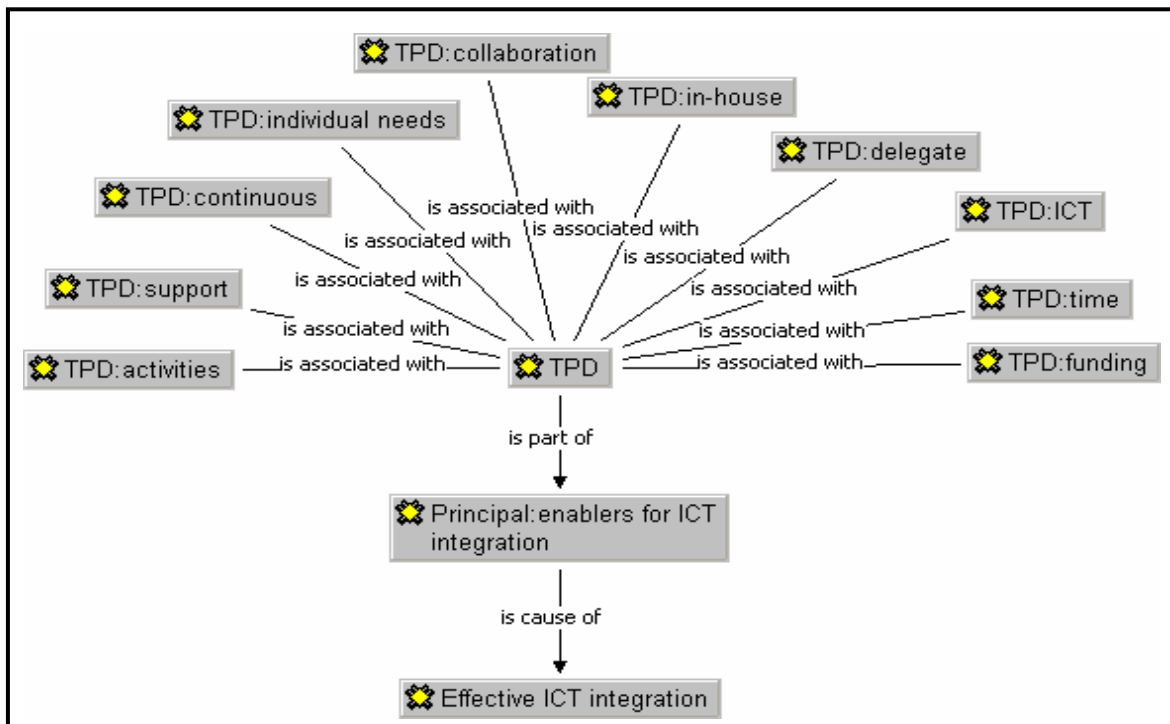
Figure 4.7   TPD enabling strategies

The enabling strategies associated with TPD are vital for principals to instigate and uphold as it will determine to what extent ICT integration will be effective and sustained.

4.4.1.1   Teacher professional development activities

Drago-Seversen (2004, p. xxi) points out the primary manner in which principals can ensure that teachers are supported in their personal and professional growth and that is through sustained effective TPD activities. TPD ought to include actions or activities that will lead to the improvement of teaching and learning practices having an effect on the development of the whole school (Zepeda, 1999, pp. 5 - 7). All respondents indicated that they initiate various TPD activities. Activities included sending teachers on courses, joint planning in

particular departments, inviting experts and specialists to present workshops, attending courses at other schools and provinces, making use of correspondence programmes and visiting other schools that are better informed.

- *We have adopted a knew style at school where their planning as I say it is in a particular department* (5:415 (73))
- *… also had someone here from the University that came and showed the people…*[159] (1:693 (65))
- *… contact with learning area specialists from other provinces and we attend their courses …*[160] (3:578 (45))
- *… visit schools to find out more about the learning area …*[161] (3:712 (45))
- *…I send all my staff to attend training courses in Gauteng*[162] (3:714 (45))
- *We received good aid from the teaching by area specialists…*[163] (3:716 (45))
- *…if they have time during break or maybe in the afternoon where we got an extra hour as a staff we go through my laptop…*(6:473 (45))
- *… in the meantime we have some programmes from NGOs we, like for instance let's say Damelin this service provider who initially sell its products through correspondence* (5:410 (49))
- *…we see what there is if there are courses or if you can maybe get a speaker…*[164] (4:467 (37))
- *Then out-sourcing a person who, who is to be clever to come give us a workshop* (5:412 (57))
- *… they sometimes have short courses or something they invite me or some of the teachers to do it* (7:313 (146))
- *… the teacher that currently runs the integration section for me, has trained the interested teachers…*[165] (8:215 (33)).

4.4.1.2   Teacher professional development support

As Young, Sheets and Knight (2005, p. 134) note nothing effective happens in a school without the endorsement and support of the principal. Blase and Blase (1994, p. 23) agree that a supportive environment allows for collaborative planning and shared decision making, provides essential training, as well as policy and curriculum expertise. Kovalchick and Dawson (2004, p. 32), Rodrigues (2005b, p. 60), Lieberman (2000, p. 77) all say that the principal must ensure that teachers receive the required support in the integration process or they will revert to their old teaching and learning practices. Johnson (2004, p. xvii) and Southworth (2005, p. 76) found that a principal demonstrating effective leadership and management abilities that provide continuous support enables teachers to succeed in even the most challenging environment, whereas an ineffective and unsupportive principal can undermine the work of even the most able, eager and committed teachers. Respondents stated that support at school was readily available:

- *You can ask someone to quickly show me how to do it and that person is immediately going to assist you*[166] (1:798 (109))

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[159] *… ook iemand gehad wat van die universiteit wat vir die ouens kom wys het…*
[160] *… kontak met vakadviseurs van ander provinsies en ons gaan woon hulle kursusse by*
[161] *…skool te gaan besoek om meer uit te vind oor die leerarea*
[162] *…ek het nou al my personeel gestuur om die opleidingskursusse in Gauteng te gaan bywoon*
[163] *Ons het veral nou baie goeie hulp gekry van vakadviseurs…*
[164] *… ons kyk maar wat 'n ou kan kry as daar kursusse is of jy dalk 'n spreker…*
[165] *… die jufrou wat nou die integrasie afdeling dryf vir my het byvoorbeeld al vir personeel wat belangstel opleiding gegee*
[166] *Jy kan vir 'n ou sê wys gou-gou net vir my hoe doen mens dit en daai persoon gaan vir jou dadelik help*

- *Yes, some go in large groups then there is training in something specific for everyone or everyone who is interested then the computer centre is packed* [167] (1:789 (73))
- *…to find out more about the learning area we, make sure that it can be done …*[168] (3:569 (45))
- *… in the afternoon we can take a few minutes we can help them to use the computer* (5:420 (105))
- *HOD that we are having a problem* (5:425 (117))
- *… we get someone from the outside who is converted with the subject concerned to come and help out* (5:427 (117))
- We open up questions to the teacher such as how far are you with your computer learning… (5:371 (105)).

4.4.1.3   Continuous teacher professional development

Several authors agree the integration of innovative practices and changes do not happen without continuous involvement from the principal (Busher, 2006, p. 151; Seyoum, 2004, p. 3; Spurr et al., 2003, p. 3; Tallerico, 2005, p. 100). Principals can provide constant support by ensuring that teacher training is a continuous process that provides regular updates on ICT development and integration in education (NCREL, 2000, p. 2; Seyoum, 2004, p. 5). Many authors state that TPD should take place continuously due to changes in the education system and the rapid developing pace of ICT (Day & Sachs, 2004, p. 55; Glatthorn et al., 2006, pp. 41 - 43; Rodrigues, 2005a, p. 1). Only three respondents indicated that continuous TPD takes place:

- *… if you are not there where you want to be, you can ask for assistance, the assistance is continuously there* [169] (1:796 (109))
- *This stuff takes place continuously through the term. That is why we have meetings for this type of stuff in the afternoons* [170] (3:741 (168))
- *… a person tries to see what the teachers are able to learn from each other…*[171] (4:465:65))
- *…educators would meet the afternoon and come together and talk about the problems that they encounter in their day* (5:435 (73)).

One respondent mentioned that TPD activities take place quarterly:

- *… takes place quarterly* (7:310 (134)).

4.4.1.4   Teacher professional development for teachers' individual requirements

Prinsloo and Van Schalkwyk (2008, pp. 162 - 163) indicate that leadership entails understanding and acknowledging the requirements and contributions of individual teachers to maximise their strengths and minimise their limitations for the benefit of the school. Day and Sachs (2004, p. 155) acknowledge that teachers are in different phases, have different requirements with respect to their personal growth and development, have different

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[167] *Ja, party gaan in groot groepe, dan is daar opleiding in iets spesifiek vir almal of almal wat belangstel dan sit hulle 'n rekenaarsentrum vol*
[168] *…meer uit te vind oor die leerarea maak ons voorsiening vir hom dat hy dit wel kan doen*
[169] *…as jy nog nie is waar jy wil wees nie kan jy maar aanhou vra , die hulp is deurgaans daar*
[170] *Hierdie goeters word deurlopend deur die kwartaal…dit is hoekom ons in die middae vergaderings het en sulke tipe van goed*
[171] *…probeer 'n ou kyk wat die ouens van mekaar kan leer…*

orientation and attitudes to change and development, seek different sources of knowledge and learn in different ways at different times in their careers. As a result training should be flexible to suit all the teachers and also be comprehensive enough to provide skills and knowledge for all levels (Tenbusch, 1998, p. 4), applicable and relevant to teachers' current classroom practices and experiences (Rodrigues, 2005b, p. 75). TPD must consequently cater for teachers' individual requirements by making use of tailor-made techniques, adult-centred instruction and a variation of delivery methods (Basinger, 2003, p. 3; Carlson & Gadio, 2002, p. 120; Center for CSRI, 2007, p. 2; Ehman et al., 2005, p. 260; Kotyk, 2006, p. 26; Lieberman, 2000, p. 78). Four respondents indicated that they take teacher's individuality into account and create TPD opportunities for the requirements of individual teachers:

- *We did this morning a survey of the staff in connection with training to specifically be able to use it* [172] (1:684 (9))
- *… so you can individually go and sit there and say to her, teach me this, assist me …*[173] (1:784 (69))
- *We assist everyone* [174] (3:581 (53))
- *They indicated what is the problem they encountered* (5:421 (105))
- *…must be on the level of the person that attends that workshop* (7:315 (154)).

4.4.1.5 Teacher professional development creates opportunity for collaboration

Numerous authors agree that collaboration allows teachers to support and motivate each other, share expertise, plan together, reflect on teaching and learning practices which in turn leads to co-operation, reduced workload, effective communication and increased teachers' efficiency and confidence (Arnold et al., 2006, p. 3; Blase & Blase, 1994, p. 19; Drago-Severson, 2004, pp. 17 - 18; Glatthorn et al., 2006, p. 19; Inger, 1993, p. 1; Leask, 2001, p. 137; Rallis & Goldring, 2000, p. 46; Rodrigues, 2005b, p. 9). Teachers in effective schools are reported to work collegially and to collaborate and achieve shared goals (Cowie & Jones, 2005, p. 9; Day & Sachs, 2004, p. 36). Collegiality is essential for effective and sustainable implementation of educational change, activities and interactions (Day & Sachs, 2004, p. 222; Gibson, 2002, p. 324; Selwyn, 2002, p. 135; Thorburn, 2004, p. 5). By continuously creating opportunities for collaboration allowing teachers to be in an environment where learning and development can take place on a regular basis (Darling-Hammond, 2005, p. 12). Brand (1997, p. 4), Moonen and Voogt (1998, p. 103), Zheng (2003, p. 8) conclude that a collaborative learning environment between teachers are of utmost importance for sustaining effective integration of ICT in education. Five respondents agreed that

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[172] *Ons het vanoggend 'n opname weer onder personeel gemaak in terme van opleidig om dit spesifiek te gebruik*
[173] *…so 'n mens kan selfs individueel daar gaan sit en vir haar sê, leer my dit help my*
[174] *Ons maak vir elkeen voorsiening*

collaboration was important and when teachers came together for TPD activities collaboration between them took place:

- *… I think they work good together* [175] (1:774 (53))
- *… I definitely think so because a person learns from your colleagues, it is a developmental process* [176] (1:804 (45))
- *… where we share with schools around us…* [177] (3:711 (45))
- *In other words there has to be continuous contact with each other…* [178] (3:724 (89))
- *… you have to learn from each other* [179] (3:726 (96))
- *… grouped together and then they talk amongst themselves about problems they encounter* (5:425 (117))
- *Yes there is collaboration* (6:462 (121))
- *In any learning area there is a head of that learning area, they've got to do the same planning for the same learning area for any given time* (7:309 (130)).

4.4.1.6   In-house teacher professional development

Hezel Associates (2005-2006, pp. 2 - 4) indicate that principals have significant responsibilities when it comes to initiating, organising, planning and implementing TPD in their schools, especially through creating in-house training opportunities. Tomlinson (2004, p. 47) points out that every school should have its own particular training strategy to support teachers to achieve pre-determined goals and objectives. Teachers then realise the importance of training to guide them in achieving educational objectives and to make use of every possible training opportunity (Stephens & Crawley, 1994, pp. 81 - 82; Tomlinson, 2004, p. 47). Five of the respondents indicated that they do make use of in-house TPD:

- *I must say we handle our own training* [180] (1:749 (73))
- *At this stage we do it ourselves* [181] (3:733 (136))
- *… we offer courses you know at the end of the year …* (7:311 (142))
- *Initially we do have workshops early in the year about computers* (5:402 (49))
- *… give training to teachers who are interested…* [182] (8:312 (33)).

One respondent says: *… I ensure that my teachers' are trained…*[183] (4:466 (85)) and then contradicts himself by stating: *I did previous years, every Friday afternoon had a weekly teachers' meeting and then I handled certain training aspects…*[184] (4:381 (141)) proving that currently he is not ensuring that his teachers are trained.

4.4.1.7   Teacher professional development activities are delegated

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[175] *...ek dink hulle werk nogal goed saam*
[176] *…ek dink definitief want 'n mens leer mos maar by kollegas, dis 'n groei proses*
[177] *…waar ons met skole om ons deel …*
[178] *Met ander woorde daar moet voortdurend kontak wees met mekaar …*
[179] *…jy moet by mekaar leer …*
[180] *Maar ek moet sê ons hanteer ons eie opleiding*
[181] *Op hierdie stadium is dit maar ons self wat dit doen*
[182] *… vir personeel wat belangstel opleiding gegee …*
[183] *…ek kyk dat my mense opgelei is…*
[184] *… Ek het vroeër jare elke keer 'n Vrydagmiddag 'n personeelvergadering gehad, wekliks gehad en dan het ek nou bepaalde opleidingsaspekte het ek nou hanteer…*

According to Schumaker and Sommers (2001, pp. 28 - 29), Tomlinson (2004, p. 99) principals should delegate power, authority and responsibility as they alone cannot achieve the set aims and objectives. Prinsloo and Van Schalkwyk (2008, p. 57) point out although principals through delegation entrust teachers with authority and responsibility, the principal remains accountable. Five respondents indicated that they delegated the responsibility for TPD to teachers in their school:

- *This one lady's extra-mural activity is training given in ICT* [185] (1:797 (109))
- *… our computer study teacher gives training in beginner courses and advanced courses for staff* [186] (3:729 (128))
- *… teacher offer Excel for everybody or Word or basic computer literacy* (7:312 (142))
- *…come together with their HOD trying to work out their problems* (4:354 (73))
- *… on how to search, how to attain the information you want, how to set up a PowerPoint presentation* [187] (8:313 (33)).

4.4.1.8 Teacher professional development in Information and Communication Technology

There is a common necessity among teachers that ICT forms part of their TPD (Becta ICT Research, 2006, p. 38; Francis & Ezeife, 2007, p. 3). Several authors proclaim the importance of principals' support and encouragement of TPD activities enabling teachers to engage in innovative practices by making use of ICTs in their teaching and learning (Becta ICT Research, 2005, p. 5; Berube et al., 2004, pp. 1 - 3; Drago-Severson, 2004, p. xxi; Han, 2002, p. 294; Roberts & Associates, 1999, p. 10; Scrimshaw, 2004, p. 5; Zepeda, 1999, p. 6). Successful ICT integration in education requires that teachers have the relevant ICT knowledge and skills (Albion, 1999, p. 1; Asan, 2003, p. 154; Chen & Chang, 2005, p. 4; Gibson & Oberg, 1999, p. 2; NCREL, 2000, p. 1). Rodrigues (2005b, p. 19) states that the introduction of any innovatory practice has to be accompanied by significant TPD. Roberts and Associates (1999, p. iv) concur that TPD programmes can help teachers to address the impact of ICT and make appropriate decisions about the role that ICT will play in their teaching practices. Sallis and Jones (2002, p. 108) reveal by learning how to integrate ICT communities of practice are built up. Five respondents gave an indication that they created TPD opportunities for ICT training. The training focused on acquiring the basic ICT knowledge and skills:

- *… the use of Excel and that type of stuff, PowerPoint* [188] (3:730 (128))
- *… there is training in something specific for everyone or everybody who is interested…* [189] (1:787 (73))

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[185] *Juis omdat dit hierdie een dame se buitemuurs is opleiding in ICT*

[186] *…ons rekenaarstudie onderwysers bied vir personeel beginnerskursusse aan en 'n bietjie meer gevorderde kursusse aan*

[187] *…oor hoe om te search, hoe om inligting te kry wat hulle wil hê, hoe om 'n PowerPoint presentation op te stel*

[188] *…die gebruik van Excel en daai tipe van goeters, PowerPoint*

[189] *… daar opleiding in iets spesifiek vir almal of almal wat belangstel…*

- *… we do have workshops early in the year about computers* (5:409 (49))
- *… teacher offer Excel for everybody or Word or basic computer literacy* (7:312 (142))
- *… on how to search, how to attain the information you want, how to set up a PowerPoint presentation* [190] (8:313 (33)).

Becta ICT Research (2006, p. 41) shows that despite the high levels of training, teachers indicated that ICT was the common area in which they required more professional development. Contradictory, most principals indicate that their teachers' skills in ICT meet or exceed current requirements (Becta ICT Research, 2006, p. 38). One respondent concured with Becta ICT Research with the following statement: *We did do it. We are all fairly computer literate* [191] (4:336 (77)). My field notes indicate the respondent did not recently create any TPD activities for the attainment of ICT knowledge and skills as he presumed that his teachers were ICT literate although he did no inquire to determine whether his assumption was correct.

Shelly, Cashman, Gunter and Gunter (2004, p. 6.05) state that ICT: "... cannot enhance learning unless teachers know how to use and integrate ICT into curriculum-specific or discipline-specific areas. TPD on the integration of ICT in the curriculum is required (NCREL, 2000, p. 1; Seyoum, 2004, p. 7). Teachers should participate in professional development activities where the emphasis falls on intensive curriculum-based ICT training (Zhao & Bryant, 2006, p. 53). Day and Sachs (2004, p. 242) maintain: "There is no curriculum development without teacher development." Only two respondents indicated that they provide training for ICT integration into the curriculum. The one respondent sends his teachers on training courses: *… I'm soon sending them on a course where they receive training because in their learning plan provision is made for the presenting of computer programmes* [192] (3:707 (29)) and the other respondent let the teachers illustrate how they incorporate ICT in their teaching so that the other teachers can learn: *…PowerPoint presentation of the teachers. I think the way in which you teach you have to implement the technology…*[193] (1:808(57)) and they work out lessons together integrating ICT: *…you are not going to give in a poor product to you colleague, if you work out a part…* [194] (1:775 (53)).

4.4.1.9   Allocation of time for teacher professional development

Numerous authors agree that it is crucial to create time for TPD (Cope & Ward, 2002, p. 10; Glatthorn et al., 2006, p. 58; Rallis & Goldring, 2000, p. 49; Tallerico, 2005, p. 119). Centre

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[190] *…oor hoe om te search, hoe om inligting te kry wat hulle wil hê, hoe om 'n PowerPoint presentation op te stel*
[191] *Ons het dit gedoen. Ons is darem almal al redelik rekenaar geletterd*
[192] *…stuur ek nou op 'n kursus binnekort waar hulle gaan om opleiding te kry want binne in hulle leerplan word daar voorsiening gemaak vir die aanbieding van rekenaarprogramme*
[193] *PowerPoint aanbieding kyk van hierdie juffrou. So ek dink die manier van onderrig gee, moet jy tegnologie aanwend*
[194] *…jy gaan nie nou nie 'n swak produk vir jou kollegas gee nie, as jy een deel uitgewerk*

for CSRI (2007, p. 1) states insufficient time not only prohibits attendance of TPD activities, but it also leads to a stressful working environment which diminishes the quality of instruction, morale, effectiveness and commitment. Teachers require time to learn new technologies and integrate their newly attained skills into their teaching and learning practices. Such changes take time and do not happen overnight (Bradley, Kallick & Regan, 1991, p. 14; Buckenmeyer, 2005, p. 14; Carlson & Gadio, 2002, p. 124; Day & Sachs, 2004, p. 28; Gibson, 2002, p. 322; Knapp & Glenn, 1996, p. 222; Means, 1994, pp. 215 - 216; Theroux, 2004, p. 3; Woodbridge, 2004, p. 2; Zepeda, 1999, p. 85). When teachers do not have sufficient time to incorporate new innovations, skills or strategies, they usually revert to their previous teaching and learning practices. Scrimshaw (2004, p. 11) emphasises the importance of allocating sufficient time as it is one of the key elements for teachers to successfully integrate ICT into their daily teaching and learning practices. A few respondents indicated they generated time for TPD activities into the busy schedules:

- *…weekly there is co-ordinated meetings between the staff* [195] (3:725 (89))
- *… the teachers have weekly learning area meetings* [196] (1:777(53)
- *…educators would meet the afternoon and come together and talk about the problems that they encounter in their day* (5:435 (73)).

4.4.1.10   Sufficient teacher professional development funding

Although many schools have been provided with sufficient computers and adequate facilities, teachers' use of these facilities and computers are limited. This if often due to insufficient funding for TPD in the use of ICT (Carlson & Gadio, 2002, p. 125; Day & Sachs, 2004, p. 75; Guru & Percy, 2005, pp. xiii,xiv; Selwyn, 2002, p. 23; Seyoum, 2004, p. 3). It is therefore necessary to allocate sufficient resources for TPD activities. With continuous technological advancements and limited financial resources, principals have to be creative in generating sufficient funds for effective and sustainable ICT integration and ICT infrastructure (Seyoum, 2004, p. 1; Walsh, 2002, p. 19). The literature indicates that it is crucial to ensure sufficient funding for teachers to receive TPD for the attainment of ICT knowledge and skills. Four respondents gave an indication that they do make provision in their budgets for TPD:

- *… in the budget you make provision for it, …* [197] (4:372 (137))
- *…that has to be in the budget it is non-negotiable …*[198] (1:674 (121))
- *Each year, yes we do make a budget necessary for that* (5:358 (81))
- *…we have a special budget for TPD …* [199] (3:568 (45)).

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[195] *…weekliks is daar koördineringsvergaderings tussen die personeel*
[196] *…so die ouens het weekliks vakvergaderings*
[197] *… ou se begroting maak jy darem voorsiening vir dit…*
[198] *…daai moet in die begroting wees dit is ononderhandelbaar*
[199] *… ons het 'n spesiale begroting vir personeelopleiding*

4.4.1.11   Conclusion

The analysis gave me an indication that principals must execute most of the enabling TPD strategies to ensure effective and appropriate TPD. The following enabling strategies emerged and proved to have a measurable impact on effective TPD for ICT:

- TPD activities
- TPD support
- Continuous TPD
- TPD for teachers' individual requirements
- TPD creates opportunity for collaboration
- In-house TPD
- TPD activities are delegated
- TPD in ICT
- Allocation of time for TPD
- Sufficient TPD funding.

It is extremely important that principals implement most if not all of the above enabling TPD strategies as it will aid them in the process to empower their teachers in regard to effective teaching and learning. The more enabling strategies they implement the better. From my analysis I could conclude the following information with regard to the respondents' implementation of TPD enabling strategies (Table 4.9).

Table 4.9   Respondents' implementation of TPD enabling strategies

TPD enabling strategies		1	2	3	4	5	6	7
1	Activities	X	X	X	X	X	X	X
2	Support	X		X	X	X		
3	Continuous	X		X		X		
4	Teachers' individual requirements	X		X		X		X
5	Creates opportunity for collaboration	X		X		X	X	X
6	In-house	X	X	X		X		X
7	Activities are delegated	X	X	X		X		X
8 ICT	Basic skills	X	X	X		X		X
	Curriculum	X		X				
9	Allocation of time for continuous TPD	X		X		X		
10	Sufficient funding	X		X	X	X		

Some respondents implemented more enabling strategies than others. It is however ironic that effective ICT integration revolves around creating continuous TPD activities that assist teachers in integrating ICT into the curriculum, the enabling strategy that most principals seem to disregard is providing TPD opportunities for teachers to learn how to integrate ICT into their teaching practices. Providing continuous TPD and the allocation of time for

continuous TPD seem to be strategies that most respondents neglect to implement. Respondent two, four and six used the least enabling strategies. Respondents one and three were the only respondents who used all the enabling strategies.

4.4.2   Information and CommunicationTechnology enabling strategies that principals can follow to develop and sustain teachers' integration of Information and CommunicationTechnology in teaching and learning

Ho (2006, p. 2) says that principals should encourage teachers to use ICT in their instructional practices. Gibson (2002, p. 319) suggests that principals as the leaders in their schools, should not underestimate the impact of integrating ICT into teaching and learning. They should be actively involved in every aspect relating to ICT integration, and attain competencies on the use of ICT to increase the chances that teachers will be successful in integrating ICT in their teaching practices. Thomas (2006, p. 41) confirms this view: "Institutional leadership in the form of the school principal and the school management team are seen as having significant influence on the integration of computers in the classroom." Many authors state ICTs form an important component that can inspire teachers, assist them with the challenges of the teaching profession and promote their lifelong professional development (Dirksen & Tharp, 1996, p. 2; Jackson, 2000, p. 1; Leask, 2001, p. 61; Loveless & Dore, 2002, p. 154). Jimoyiannis and Komis (2007, p. 167) comment that ICT integration is more than just putting computers in classroom, teachers are more likely to make use of ICTs in their teaching and learning practices if they are convinced of ICT's effectiveness and usefulness. Once again authors point out that the integration of innovative practices and changes do not happen without continuous involvement from the principal (Busher, 2006, p. 151; Seyoum, 2004, p. 3; Spurr et al., 2003, p. 3; Tallerico, 2005, p. 100). From the literature, my field notes and analyses the following categories indicating the enabling strategies associated with ICT for effective ICT integration emerged (Figure 4.8).
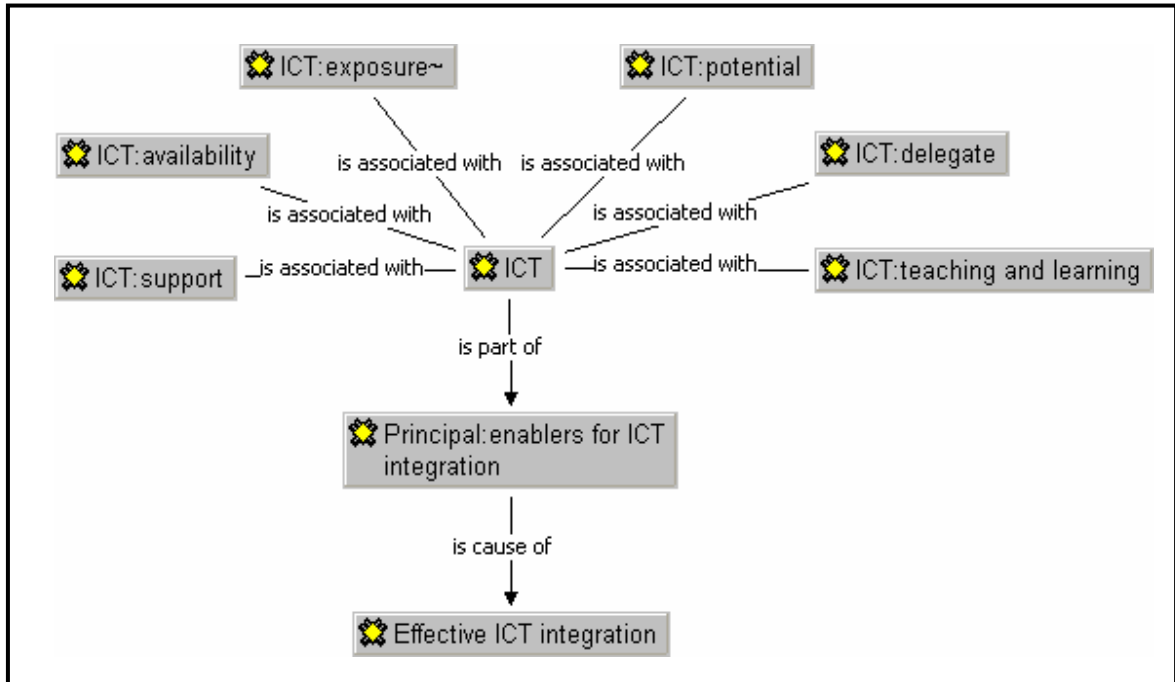
Figure 4.8   ICT enabling strategies

4.4.2.1   Information and CommunicationTechnology support

Teachers also require ICT support when it is expected of them to learn and integrate ICT effectively into their teaching and learning practices (Becta ICT Research, 2003, p. 1; Buckenmeyer, 2005, p. 15; Han, 2002, p. 296; Scrimshaw, 2004, p. 10; Seyoum, 2004, p. 3). Three respondents had specific people giving ICT support:

- *… a full-time staff member that only does that, his task is to service and repair the computers…*[200] (3:744 (181))
- *… we created a HOD post what I call HOD IT …*[201] (1:807 (17))
- *…we are a KDA school…*[202] (1:806 (61)).

My field notes indicate KDA schools get continuous technical support as they supply the maintenance aspect at the school.

- *… people come every week to check whether everything is in working order*[203] (4:460 (197))
- *… should there be any problems with the computers report it to them…* (5:408 (33)).
- *We've got an IT group* (7:301 (29)).

4.4.2.2   Information and CommunicationTechnology availability

Drago-Severson (2004, pp. 53 - 54) states that insufficient resources negatively impact on teachers' learning and teaching as it determines the frequency, quality and the number of teachers that can undergo TPD. Literature indicates that functional technological

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[200] *…'n voltydse personeellid wat net dit doen, dit is sy taak om die rekenaars te hersien en te herstel…*
[201] *…ons het 'n departementshoofpos geskep wat ek noem 'n departementshoof IT*
[202] *… ons 'n KDA skool…*
[203] *…… ouens kom elke week dan kom kyk hulle of die goed reg werk…*

infrastructure and facilities must be available before teachers can integrate ICT on a regular basis in teaching and learning activities (Becta ICT Research, 2004, p. 3; Cowie & Jones, 2005, p. 10; Gibson & Oberg, 1999, p. 2; Han, 2002, p. 296; Means, 1994, p. 177; Seyoum, 2004, p. 2). For teachers to be successful, principals should take the necessary steps to ensure that appropriate, flexible and instructional resources are available when teachers require them (Center for CSRI, 2007, pp. 2 - 3; Gordon, 2003, p. 3; Scrimshaw, 2004, p. 5).

Some respondents indicated that their teachers had access to Internet and network facilities:

- *Yes all teachers can have an e-mail address at the school* (7:279 (246))
- *… in other words you can connect at any place and you can find the information that you want* [204] (3:735 (136))
- *… everyone has at least their own e-mail address* [205] (4:450 (77))
- *…quickly send one another e-mail* [206] (1:708 (41)).

Teachers also had various options of facilities available for the use of ICT:

- *In the administration block there are a total of ten computers…* (6:453 (25))
- *… a computer that is allocated just for their use …* [207] (4:446 (33))
- *The media centre also has a computer with a projector* [208] (4:448 (33))
- *We have given a few teachers and the head of grades computers, there are nobody in the office without a computer* [209] (1:799 (117))
- *… media centre is also equipped, you can always go there with your class if you want to present a lesson, the facility is available for everyone* [210] (1:766 (37))
- *… there are forty computers in a class and then there is in every office of the HOD and the SGB everyone has a computer…* [211] (3:749 (136))
- *No, we have a teachers' computer centre right next door. At present there is three computers there, there is computers in the staff room, they can use that, there is a computers in each and every head of department's office which the department can use and if needs to be they can use my computer if I'm not using it* (7:308 (93))
- *… They'll go to the computer centrums and use the computers to solve their problems* (5:416 (85)).

However, the availability and access to an infrastructure for ICT does not guarantee that teachers integrate ICT effectively (Buckenmeyer, 2005, pp. 3, 9; Rodrigues, 2005b, p. 19; Seyoum, 2004, p. 3; Zhao & Bryant, 2006, p. 58). One respondent's statement concurs with that of the above authors… *there over a hundred computers that are linked to a network and everybody has access to the Internet and e-mail...* [212] (4:458 (165)). Still there are teachers at his school who are resisting making the required changes to incorporate ICT: *And obviously you*

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[204] *…met ander woorde, jy kan by enige plek inskakel en jy kan die goeters, inligting trek wat jy wil hê*
[205] *…hulle het al elkeen hulle eie e-pos adres ten minste*
[206] *…stuur julle gou vir mekaar e-pos*
[207] *…'n rekenaar wat net vir hulle gebruik is…*
[208] *Die mediasentrum het ook 'n rekenaar met 'n projektor*
[209] *Ons het vir 'n klomp onderwysers en vir die graadhoofde…hulle het almal rekenaars, daar is nie ouens wat in 'n kantoor êrens nie 'n rekenaar het nie*
[210] *…mediasentrum is ook ingerig…jy kan altyd met 'n klas daarheen gaan as jy so les wil aanbied, so die fasiliteit is vir almal daar*
[211] *…daar is veertig rekenaars in 'n klas en dan is daar in elke kantoor van die departementshoofde van die beheerliggaam elkeen het 'n rekenaar…*
[212] *… daar is oor die honderd rekenaars wat op 'n netwerk is en elke ou het toegang tot die Internet en toegang tot e-pos…*

have, I say again, the resistance to change is always a factor [213] (4:400 (201)), *I have such people, lady, teaching for thirty-five years and she wants the book in her hands* [214] (4:448 (33)). One respondent mentioned that it was important to book the computer centre to ensure that it was available when required: … *it is important that they book the computer lab…* (5:419 (101)).

4.4.2.3　Information and CommunicationTechnology exposure

Authors state teachers' perceptions and practices change as they become more comfortable with using ICT (Asan, 2003, p. 154; Francis & Ezeife, 2007, p. 4; Lal, 2002, p. 2; Webber & Robertson, 1998, pp. 9 - 10; Zheng, 2003, p. 8). Theroux (2004, p. 2) maintains there should be sufficient opportunity for hands-on experience. Respondent's indicated that they exposed their teachers to ICT:

- *Yes, our big thing is to give them the technology…* [215] (1:665 (85))
- *… the continuous providing of available facilities and that plays a prominent part* [216] (1:671 (113))
- *We have given twenty people laptops and in twenty classes we have installed data projectors…* [217] (1:756 (9))
- *… it is the satisfaction they get when they use it* [218] (1:790 (89))
- *We are in the process of providing every teacher with a laptop…* [219] (3:547 (17))
- *… we also have that computer with that screen …* [220] (4:454 (97)).

4.4.2.4　Information and CommunicationTechnology potential

Wang and Woo (2007, p. 149) points out that the primary factor that has an influence on the effectiveness of learning is the pedagogical design that justifies the how, why and the way in which ICT is to be used. Jimoyannis and Komis (2007, p. 167) agree that teachers are more likely to make use of ICTs in their teaching and learning practices if they are convinced of ICTs' effectiveness and usefulness. Means (1994, p. 18) states: "There is a tremendous need for teacher training that will demonstrate to teachers the potential of various technologies…"

Cope and Ward (2002, pp. 1, 10), Zhao and Bryant (2006, p. 55) agree that to integrate ICT successfully in education it is important that teachers have the appropriate perceptions of ICT usefulness as it has an impact on their instructional practice. All the respondents indicated that ICT integration has potential with regard to the enhancement of education:

- *…did a PowerPoint presentation that was extremely impressive* [221] (1:728 (29))
- *… they see her as an inferior teacher because she does not use the technology* [222] (1:730 (37))

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[213] *En natuurlik het jy, ek sê weer, daai weerstand teen verandering is maar altyd 'n faktor*

[214] *Ek sit met sulke mense daar, tannie hou nou al vir vyf en dertig jaar so skool en sy wil 'n boek in die hand hê*

[215] *Ja ons groot ding is om hierdie tegnologie vir hulle te gee…*

[216] *…die aanhoudende beskikbaarstelling van fasiliteite en dit speel nogal 'n baie groot rol*

[217] *Ons het ook nou vir twintig ouens laptops gegee en in twintig klaslokale dataprojektors ingesit…*

[218] *… is die satisfaksie wat hulle daaruit kry as hulle dit gebruik*

[219] *Ons is op die oomblik besig om vir elke personellid 'n laptop te kry…*

[220] *… ons het ook nou daai rekenaar met daai skerm…*

[221] *…'n hele PowerPoint ding gedoen het geweldig indrukwekkend…*

- *… so the use of technology just makes life easier and in the long run saves a lot of time* [223] (1:733 (57))
- *…I think if you experience the learners are paying attention and it is quiet in your class and it is intelligent questions, the learners are clued to this type of stuff* [224] (1:735 (101))
- *… it is easier to attain information* [225] (3:688 (13))
- *… click click quickly here and give a Biology class I just quickly want to show the learners how the cross-section of a leaf looks like, click on Oxford University.www there is the thing all in colour for the learners to see...* [226] (4:415 (165))
- *… use of the computers now by doing their work themselves…* (5:417 (93))
- *… prepare to share some of the information through the memory stick it is actually tells you that we have moved a long way* (6:423 (101))
- *… teacher could have a laptop, they could present their classes so much more efficient with PowerPoint* (7:283 (53))
- *If you can see the bigger picture and see what computers are worth and especially in teaching* (7:306 (85))
- *… once a month we go to the American embassy then they put up a live digital video conference* [227] (8:282 (37)).

4.4.2.5   Delegating Information and CommunicationTechnology responsibility

Blase and Blase (2001, p. 41) point out that the successful shared-governance principals realise by incorporating teachers in the decision-making process, it is essential for empowering teachers, and that cooperative decision-making is the foundation of shared governance. Drago-Severson (2004, p. 100) as well as Blase and Blase (2001, p. 65) agree that having teachers assuming responsibilities creates the opportunity for teachers to learn, grow professionally, make decisions and become involved. This provides teachers with a sense of ownership in the overall operation of the school and will contribute to a positive and enthusiastic teacher corps.

- *… the one teacher in the computer centre her extra-mural activities are teacher training…* [228] (1:786 (69))
- *… vice-principal that is responsible for IT in the school…* [229] (1:800 (121))
- *… then I also have a vice-principal that is responsible…* [230] (3:705 (25))
- *… I also appointed a committee of teachers…* [231] (3:706 (29))
- *… two teachers who are responsible and they are the people who are in charge of the computers…* (5:407 (33))
- *..the stuff we have now but the teachers also have to see how it works…* [232] (4:468 (205)),
- *We've got an IT group* (7:301 (29))
- *… a lady that drives the programme…* [233] (8:308 (17)).

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[222] *… hulle beskou haar as 'n swakker onderwyseres want sy wend nie nou hierdie tegnologie aan nie*
[223] *…so die aanwending van die tegnologie maak net die lewe vir 'n ou makliker en spaar op die ou vir 'n ou end baie tyd*
[224] *…ek dink as jy ervaar die kinders wat oplet dit is nou lekker stil in jou klas en dis intelligente vrae die kinders sit vasgenael vir hierdie goed*
[225] *…dis baie makliker om inligting te bekom*
[226] *……kliek kliek gou gou hierso en ek gee 'n biologie klas ek wil net vinnig vir die ouens wys hoe lyk die deursnit van hierdie blaar, kliek op Oxford Universiteit.www woeps, daar lê die ding mooi in kleur: wys vir die kinders…*
[227] *……eenkeer 'n maand gaan ons na die Amerikaanse ambassade toe dan sit hulle vir ons 'n live digital video conference op*
[228] *…die een juffrou in die een rekenaarstudiesentrum haar buitemuurs is personeelopleiding…*
[229] *… adjunkhoof wat verantwoordelik is vir IT in die skool…*
[230] *… dan het ek ook 'n adjunkhoof wat daarmee belas is…*
[231] *… ek het juis nou 'n komitee saamgestel van personeel…*
[232] *… die goeters het ons nou daar, maar die onderwyser moet ook nou kyk hoe dit werk*

4.4.2.6 Information and CommunicationTechnology integration in teaching and learning

Shelly, Cashman, Gunter and Gunter (2004, p. 6.05) indicate that curricula should drive ICTs. Teachers should use appropriate ICTs for the particular learning content to enhance learning. Guru and Percy (2005, pp. 5 - 6), Wang and Woo (2007, p. 149) accentuate the fact that ICTs should not be seen as separate disciplines. It must enhance the existing curriculum areas through integration as a resourceful tool to teach, rather than as a separate subject to teach about. Authors agree ICT is not transformative on its own. ICTs require teachers to integrate it successfully into the curriculum and instructional framework, align it with teaching and learning outcomes and use it for engaged learning projects (Kovalchick & Dawson, 2004, p. 33; NCREL, 2000, p. 1). Literature indicates curriculum integration refers to the effective integration of ICT throughout the curriculum to help learners meet the outcomes of each learning area. The computer is a tool for generating and modifying curricula, enabling teachers to incorporate the latest approaches into their teaching and learning (Albion, 1999, p. 1; Di Benedetto, 2005, p. 2; Leask, 2001, p. 181; Somekh & Davis, 1997, p. 100; Wikipedia, 2006, p. 3). Plomp, Anderson, Law and Quale (2003, p. 16) point out that learning with ICT indicates the use of various computer applications that enhance teaching and learning practices. Learning through ICT means that ICT is integrated so completely as an essential tool in the curriculum that the teaching and learning of that curriculum is no longer possible without it. Curriculum support involves providing continuous assistance and guidance to teachers in their use of ICT in the curriculum as well as the provision of TPD activities that focus on ICT training and integration (Becta ICT Research, 2003, p. 1). Carlson and Gadio (2002, p. 1) conclude that, teachers are required to integrate ICT appropriately and effectively into education. Three respondents indicated they realised the importance of integrating ICT into teaching and learning especially thinking of education in the future:

- *…if we want to teach our learners we have to adapt to their world by using the technology* [234] (1:801 (121))
- *…because you are working with the type of learner that is focused on technology* [235] (3:721 (69))
- *…make it a point that the computers are incorporated in class and curriculum…*(5:336 (53).

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[233] *… dame wat die program vir ons bestuur…*

[234] *…as ons vir hulle kinders wil skool hou dat dit aanpas by hulle wêreld deur van die tegnologie gebruik te maak…*

[235] *…omdat jy met die tipe kind wat jy nou mee werk is gerig op tegnologie*

4.4.2.7   Conclusion

The analysis gave me an indication of the ICT enabling strategies had to be implemented to ensure effective and sustainable ICT. The following enabling strategies emerged and showed to have a considerable impact on effective ICT integration:

- ICT support
- ICT availability
- ICT exposure
- ICT potential
- Delegate responsibility of ICT
- ICT integration in teaching and learning.

The more enabling strategies they implement the better. From my analysis I drew information with regard to the respondents' implementation of ICT enabling strategies (Table 4.10).

Table 4.10   Respondents' implementation of ICT enabling strategies

ICT enabling strategies	1	2	3	4	5	6	7
1 Support	X		X	X	X		X
2 Availability	X		X	X	X	X	X
3 Exposure	X		X	X			
4 Potential	X	X	X	X	X	X	X
5 Delegate responsibility	X	X	X	X	X	X	X
6 Integration in teaching and learning	X		X		X		X

Respondents one and three implemented all ICT enabling strategies. Respondents two and six indicated implementing the least ICT enabling strategies. All the respondents acknowledged ICTs' potential and delegated tasks relating to ICT. The enabling strategy that was implemented the least was teachers being exposed to ICT and integrating ICT into teaching and learning. I presume insufficient exposure influenced teachers' integration of ICT into their practices.

4.4.3   Teacher enabling strategies that principals can follow to develop and sustain teachers' integration of Information and Communication Technology in teaching and learning

Various authors report effective teachers are the determining factor in quality education and change in education ultimately rely on teachers (Borko, 2004, p. 3; Chen & Chang, 2005, p. 1; Jacobs et al., 2004, p. 24). Prinsloo and Van Schalkwyk (2008, pp. 162 - 163) state leadership entails understanding and acknowledging the requirements and contributions of

individual teachers to maximise their strengths and minimise their limitations for the benefit of the school. Many authors are of the same opinion that it is important that the principal creates and sustains an environment where teacher learning can flourish and continuous development can take place through the provision of necessary resources (Blase & Blase, 2001, pp. 16, 80; Day & Sachs, 2004, p. 36; Drago-Severson, 2004, p. 39; Sallis & Jones, 2002, p. 96; Young et al., 2005, p. 26). Literature indicates principals are primarily responsible for determining and maintaining the climate and the culture of schools. Therefore they also influence the teaching and learning that occur at the school (Arnold et al., 2006, p. 3; Blase & Blase, 2001, p. 97; Gordon, 2003, p. 4; Spurr et al., 2003, p. 4). Glatthorn, Jones and Bullock (2006, p. 56) as well as Spurr, Rosanowski and Williams (2003, p. 3) concur principals should strive to improve teachers' working conditions and morale, develop a culture in which teachers work together for the common good and develop the capacity and commitment of teachers.

Gordon (2003, p. 2) and Tomlinson (2004, pp. 101 - 102) add by providing appropriate support and ensuring conducive working conditions will positively affect teachers' attitude for the implementation of change in their teaching and learning practices. Figure 4.9 indicates the importance of teachers in effective ICT integration. The principals must ensure supportive working conditions where continuous TPD can take place. Principals must therefore implement enabling strategies which focus on the teachers as individuals to maximise their strengths and minimise their limitations for the benefit of the school. From the literature, my field notes and analyses the following categories indicating the enabling strategies associated with teachers' for effective ICT integration emerged (Figure 4.9).
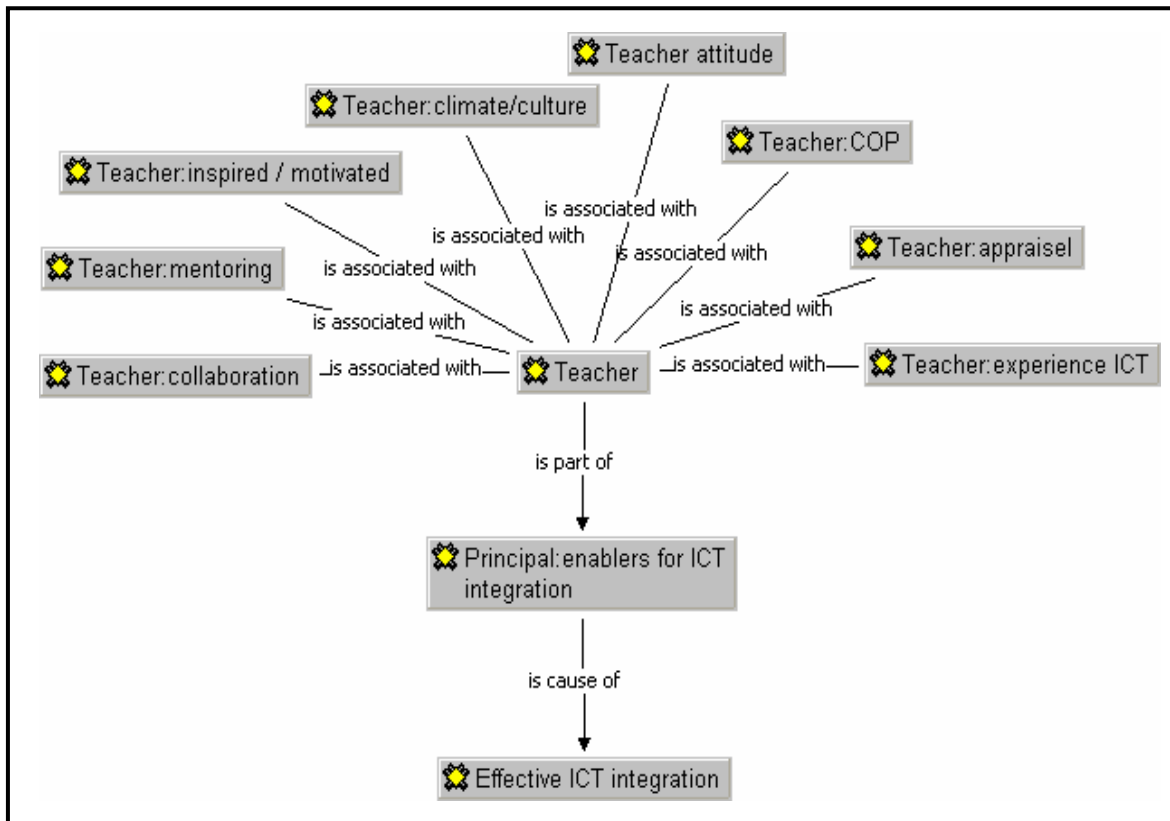
Figure 4.9 **Teacher enabling strategies**

4.4.3.1 Teacher collaboration

Teachers in effective schools are reported to work collegially and to collaborate and achieve shared goals (Cowie & Jones, 2005, p. 9; Day & Sachs, 2004, p. 36). Steyn and Van Niekerk (2005, p. 113) add teachers working together in teams become more effective, professional and efficient. This leads to improving the quality of education and creating better learning and teaching environments. Carlson and Gadio (2002, p. 121) as well as Schlager and Fusco (2003, p. 4) agree that it is essential to create opportunities for collaboration where teachers can share experiences, discuss possibilities, reflect on their learning, apply new strategies, and evaluate their learning. Numerous authors accentuate the fact that there are a variety of benefits when teachers take part in collaboration. Collaboration allows teachers to support and motivate each other, share expertise, plan together, reflect on teaching and learning practices which in turn lead to co-operation, reduced workload, effective communication and increased teachers' efficiency and confidence (Arnold et al., 2006, p. 3; Blase & Blase, 1994, p. 19; Drago-Severson, 2004, pp. 17 - 18; Glatthorn et al., 2006, p. 19; Inger, 1993, p. 1; Leask, 2001, p. 137; Rallis & Goldring, 2000, p. 46; Rodrigues, 2005b, p. 9). Five respondents indicated that opportunities for collaboration are created for teachers to collaborate about their teaching and learning practices:

- … *extremely impressive, was shown to all the teachers …*[236] (1:763 (29))
- …*you work something out and you give it to your colleague …*[237] (1:768 (37))
- …*they learn from each other and it makes them excited…*[238] (1:653 (61))
- …*you can exchange ideas and you attend the discussions on the different subjects…*[239] (3:715 (45))
- … *you have to lean from one another* [240](3:726 (96))
- …*we come together as a CMT look at it and talk about it and see whether it could fit amongst ourselves or not. There after the CMT is satisfied and understand then we take this matter to the teachers and we talk about it…*(5:437 (57))
- …*grouped together and then they talk amongst themselves about the problems they encounter* (5:425 (117))
- *Yes there is collaboration…* (6:462 (121))
- … *prepare to share some of the information through the memory stick it is actually tells you that we have moved a long way* (6:423 (101))
- … *as a staff we go through my laptop and they choose a topic and either they take it in a form of a hard copy that we made and it is print out or those who have memory sticks we make copies so that if we make any changes we could* (6:456 (45))
- … *teachers sharing information…* (6:463 (121))
- *but they could see immediately as soon as they interact with other colleagues from other schools they see that there is a gap of actual fact of information you could see other colleagues are quite long that it's advanced* (6:459 (65))
- *In any learning area there is a head of that learning area, they've got to do the same planning for the same learning area for any given time* (7:309 (130)).

4.4.3.2   Teacher mentoring

Cowie and Jones (2005, p. 9), Steyn and Van Niekerk (2005, p. 266) state that mentoring is a way of supporting teachers to ensure that they acquire the necessary knowledge and skills. Busher (2006, pp. 142 - 143), Drago-Severson (2004, p. 18), Zepeda (1999, p. 111) agree mentoring creates a supportive learning environment where teachers can modify their current practices and get the opportunity to enhance their self-development. Mullen (2005, p. 6) and Zepeda (1999, p. 78) point out that for mentorship to have a positive and lasting effect, it should be part of the school culture. According to Clarke (2007, p. 128) a mentoring programme assists in the development of committed and competent teachers, establishing a school environment that strives for excellence in teaching and learning. Several authors state mentors should support teachers at different ICT levels, skills, preferences and abilities; helping them as individuals to integrate ICT effectively into their teaching and learning practices (McKenzie, 1999, p. 111; Shelly et al., 2004, p. 6.16; Zhao & Bryant, 2006, p. 60). McKenzie (1999, pp. 112 - 115) stipulates that effective mentors share the responsibility of integrating ICT effectively as they assist and support teachers with planning and attainment of the necessary confidence, knowledge and skills as well as applying newly learned strategies. Mentors should through continuous assessment keep track of the teachers'

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[236] … *geweldig indrukwekkend en mooi vir die hele personeel gewys het…*
[237] … *jy werk 'n ding uit en jy gee hom vir jou kollega…*
[238] …*hulle leer dit by mekaar en dit maak die ouens opgewonde…*
[239] …*jy kan gedagtes uitruil en jy woon die besprekings by van die verskillende vakke…*
[240] … *jy moet bymekaar leer*

development. Respondents indicated that they make use of a mentoring system and it is usually the senior or experienced teachers that are appointed as mentors:

- *To assist your junior teacher you can use senior teachers* [241] (3:728 (96))
- *The moment a teacher comes in then a mentor is assigned, it is usually the subject head* [242] (3:742 (176))
- *… everybody together then we introduce their mentors* [243] (3:743 (176))
- *…we have pace setters for every phase and learning area* [244] (1:773 (53))
- *Yes we do use the tutor or mentoring system* [245] (4:457 (117))
- *Usually the senior teachers, teachers who have been in the teaching profession for some time who understand and who has the experience of what teaching entails and who can also be able to assist the person with educational matters very very clearly* (5:430 (145))
- *Each new teacher is allocated to one of the oldies and they have to show them around* (7:317 (198))*.*

One respondent indicated that they introduced the mentoring concept but they are not implementing it properly: *We introduced the concept but we did not implement it properly, we are not implementing it properly here* (6:414(193)).

4.4.3.3   Teachers are inspired and motivated

Ho (2006, p. 2) accentuates that principals should encourage teachers to use ICT in their instructional practices. A number of authors agree that when principals motivate individual teachers it is important that they should understand what motivates each individual teacher. Principals should recognise the importance of and promoting teachers' motivation as it is conducive to teachers performing optimally (Everard et al., 2004, p. 25; Foskett & Lumby, 2003, pp. 79 - 80; Steyn & Van Niekerk, 2005, p. 143). Blase and Blase (1994, p. 75) as well as Foskett and Lumby (2003, p. 76) agree the encouragement of ICT integration and ongoing appropriate motivation will ensure that teachers are committed to achieve the pre-established goals. Carlson and Gadio (2002, p. 122), Butler (1992, p. 4) and Dean (1991, p. 16) point out strategies on how teachers can be motivated and what can be done to keep them motivated. These have to be considered as it increases the effectiveness of TPD activities. Rodrigues (2005b, p. 58) and NCREL (2000, p. 1) stipulate that the integration of ICT in teaching and learning depends on knowledgeable, confident and enthusiastic teachers who are motivated and are prepared to integrate ICT effectively.

- *We encourage the teachers to work out their lessons in such a way* [246] (1:622 (13))
- *Yes, it inspires the others…* [247] (1:764 (33))
- *No, they are highly motivated* [248] (1:792 (97))

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[241] *Maar om jou junior personeellid te help, kan jy gebruik maak van senior personeel*
[242] *Die oomblik as 'n personeellid inkom dan word daar 'n mentor, dit is gewoonlik die vakhoof*
[243] *…almal bymekaar dan stel ek hulle mentors aan hulle bekend…*
[244] *…ons het pasaangeërs nou maar vir elke vak en fase*
[245] *Ja ons gebruik maar die tutor- of mentorstelsel*
[246] *Ons moedig die ouens aan om hulle lesse so uit te werk*
[247] *Ja, dit inspireer dan die ander…*
[248] *Nee hulle is regtig hoogs gemotiveerd*

- *… it is already an enormous motivation to say 'wow' here I have everything…*[249] (3:738 (156))
- *… there is not one teacher who at this stage is not extremely excited, who is not positive*[250] (3:739 (160))
- *…everybody all of a sudden wants to start working with computers, they are extremely inspired*[251] (3:647 (128)
- *… I motivate and encourage them in terms of using the computers* (5:418 (97))
- *… is a token of our appreciation of the difference the teacher made* (5:424 (109))
- *… we want you to become a very, very very good teacher* (5:429 (141)).

Carlson and Gadio (2002, p. 122) conclude that some teachers require additional motivation and incentives to actively participate in TPD activities and to embrace technological-driven opportunities. Two respondents indicated that they indeed motivate their teachers but they still have teachers that resist change:

- *… the teachers are motivated to get stuff there*[252] (4:447 (33))
- *… that is also part of motivation…*[253] (4:455 (97))
- *A person does have the older teachers who are not really, they are not really clued up about it*[254] (4:449 (37))
- *.. that resistance to change is always a factor*[255] (4:461 (201)).
- *Try and motivate them to use the technology*[256] (8:305 (13))
- *… is motivation from your side to implement is and to stay relevant*[257] (8:313 (73))
- *… there are many teachers who are still totally unskilled in technology*[258] (8:316 (109)).
- *There are still teachers who quite simple still want to do as they did twenty years back; they don't feel like investigating new methods or think of alternative methods*[259] (8:324 (121)).

4.4.3.4   Teacher culture

Prinsloo and Van Schalkwyk (2008, p. 70) maintains: "A culture of teaching and learning in a school will influence a productive and positive classroom environment which is conducive to effective teaching and learning." The autjors agree that principals are primarily responsible for determining and maintaining the climate and the culture of schools. Therefore they also influence the teaching and learning that occur at the school (Arnold et al., 2006, p. 3; Blase & Blase, 2001, p. 97; Gordon, 2003, p. 4; Spurr et al., 2003, p. 4). Butler (1992, p. 12) points out to sustain such a collaborative culture, it is necessary that the principal facilitates and supports a conducive work environment. Drago-Severson (2004, p. 41) states principals shape school cultures according to a particular school's situational factors, resources and challenges. There is widespread agreement that teachers require more than just knowledge about incorporating ICT in education, they also require an ongoing supportive climate and

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[249] *… dit is al klaar 'n geweldige motivering om te sê sjoe hier het ek alles…*

[250] *…daar is een personeellid wat op hierdie stadium nie geweldig opgewonde is nie, wat nie positief is nie*

[251] *… almal wil ewe skielik wil nou begin rekenaar, hulle raak geweldig geïnspireer*

[252] *…die ouens word maar aangemoedig om daar goed te kry*

[253] *… dis nou ook maar deel van die motivering…*

[254] *'n Ou sit maar daar bietjie met die ouer mense wat nie regtig, hulle is nie regtig so "opgeclue" daaroor nie*

[255] *…daai weerstand teen verandering is maar altyd 'n faktor*

[256] *Probeer hulle aanmoedig om die tegnologie te gebruik*

[257] *…is aanmoediging van jou kant seer sekerlik om dit te doen en om relevant te bly*

[258] *…daar is nog baie ouens wat totaal nog rekenaar ongeletterd is*

[259] *Daar is party onderwysers wat doodeenvoudig nog wil doen soos wat hulle dit twintig jaar terug gedoen het en nie lus het om ander metodes te gaan ondersoek en om ander maniere te probeer uit te dink nie*

culture for sustainable, effective and institutionalised change (Akbulut et al., 2007; Chen & Chang, 2005; Cowie & Jones, 2005; Dirksen & Tharp, 1996; Gibson & Oberg, 1999; Girod & Cavanaugh, 2001; Ho, 2006; Knapp & Glenn, 1996; Leask, 2001; Loveless & Dore, 2002; Means, 1994; Moonen & Voogt, 1998; NCREL, 2000; Rodrigues, 2005b; Shelly et al., 2004; Simonson & Thompson, 1997; Spurr et al., 2003; Thorburn, 2004; Webber & Robertson, 1998). Glatthorn, Jones and Bullock (2006, p. 56), Spurr, Rosanowski and Williams (2003, p. 3) confirm principals should strive to improve teachers' working conditions and morale, develop a culture in which teachers work together for the common good and develop the capacity and commitment of them as teachers. Two respondents indicated that there is a culture at their schools where teachers really want to integrate ICT into their teaching and learning practices:

- *… at present I want to tell you here is an atmosphere in the school that you are supposed to teach in such a way…* [260] (1:699 (29))
- *So there is really a vibe…*[261] (1:782 (65))
- *…everybody all of a sudden wants to start working with computers…* [262] (3:647 (128).

Although one respondent admits that creating an ICT culture is important he indicates that it has not materialised at his school:

- *I would say it is the culture within the specific schools…* (6:458 (65))
- *… we have to, definitely for sure, create a particular culture…* (6:465 (161)).

4.4.3.5   Teacher attitudes towards Information and Communication Technology

Authors point out that the attitudes and beliefs of teachers towards ICT have an influence on the sustained use of ICT in classrooms (Asan, 2003, p. 154; Buckenmeyer, 2005, pp. 11, 14; Busch, 1995, p. 148; Chen & Chang, 2005, p. 7; Gibson & Oberg, 1999, p. 2; Thorburn, 2004, p. 2; Zhao & Bryant, 2006, pp. 53, 54). Seyoum (Seyoum, 2004), Asan (2003, pp. 153 - 154) and Zepeda (1999, p. 80) state teachers should have a positive attitude towards ICT for effective implementation and integration of ICT in education. Ajzen (1988, p. 120) maintains: "People's attitudes influence their adoption of certain behaviours and that their attitudes are determined by salient beliefs about that behaviour." Two respondents said that teachers at their schools are positive about integrating ICT:

- *… teachers have this idea we have to move forward with it…*[263] (1:779 (61))
- *… the teachers just know we are there and it must happen* [264] (1:783 (65))
- *.. there is not one teacher at this stage that is not extremely excited, that is not positive* [265] (3:665 (160)).

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[260] *…op die oomblik wil ek vir jou sê hier is 'n atmosfeer in die skool vandat jy maar veronderstel is om so skool te hou…*
[261] *So daar is regtig 'n vibe…*
[262] *… almal wil ewe skielik wil nou begin rekenaar*
[263] *… ouens het nogal 'n idee van ons moet vorentoe gaan met dit…*
[264] *…die ouens weet net ons is daar en dit moet net gebeur*
[265] *…daar is geen personeellid wat op hierdie stadium nie geweldig opgewonde is nie, wat nie positief is nie*

One respondent indicated the importance of teachers' attitudes towards ICT as there were teachers at her school who did not have the appropriate attitude towards ICT: *It depends on yourself if you want to be you can be. If you don't want to use a computer you won't ever learn how to use a computer* (7:305 (85)). *…the more you tell them you cannot break the computer the less they are interested in learning* (7:285 (77)).

4.4.3.6   Teacher community of practice

Day and Sachs (2004, p. 297) state it is essential that the COP and structures support the professional development efforts as the effectiveness of professional development is context-specific and takes into account teachers' life stage and career development, along with school-identified requirements. Busher (2006, p. 137) points out that principals should create a collaborative working community where teachers are encouraged to share perspectives, beliefs and work together as a team to sustain and improve successful teaching and learning. Other authors are of the same opinion: COP is an important enabling support agent for the integration of innovations and change. COP enables teachers to collaborate with professionals becoming an important support element for integrating ICT in teaching and learning (Day & Sachs, 2004, p. 221; Dean, 1991, p. 10; Drago-Severson, 2004, p. 24; Nolan et al., 2005, p. 4). Tomlison (2004, pp. 130, 136) confirms COP should support teachers to take risks, be innovative and develop professionally in a positive climate to become motivated and high performance teachers. Two respondents confirmed that they are striving towards a COP where teachers integrate ICT in their daily teaching and learning activities:

- *It is absolutely compulsory you can not teach here if you are not computer literate…*[266] (1:620 (9))
- *… you have to use the technology in you class teaching and can't go without it*[267] (1:759 (13))
- *…as soon as the other teachers are going to use it and you fall behind and you see "I'm falling behind", nobody likes being behind*[268] (3:740 (160)).

4.4.3.7   Teacher appraisal and incentives

Steyn and Van Niekerk (2005, pp. 280, 297) state that teachers must understand that appraisal is a mechanism through which TPD can be measured and has the potential to improve the quality of teaching and learning. Clarke (2007, p. 158) points out that the purpose of performance appraisal is to improve the performance of teachers through the use of positive reinforcements for teachers who perform well, and to support, coach and warn teachers whose performance does not meet expectations. Many authors indicate appraisal is a process that assesses teacher's performance and it should be approached delicately as

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[266] *Dis absoluut noodsaaklik, jy kan nie meer hier skool hou as jy nie rekenaarvaardig is nie…*
[267] *…jy moet hierdie tegnologie in jou klasaanbieding aanwend en kan nie meer daarsonder nie*
[268] *… sodra die ander mense dit gaan gebruik en jy raak agter en jy sien:"Hey, ek raak agter", niemand hou daarvan om agter te raak nie*

it involves teacher's personal qualities and beliefs (Rallis & Goldring, 2000, pp. 48 - 49; Steyn & Van Niekerk, 2005, pp. 155 - 156; Tomlinson, 2004, pp. 132 - 134). Clarke (2007, p. 132) observes that in South Africa performance management is required by the DoE. In South African schools the DoE uses the *Integrated Quality Management System* (IQMS) model for school improvement. The results of the development appraisal consequently form the basis for the development of the school improvement plan. The responsibility for developing the school improvement plan rests with the school development team of which the principal is a member. As noted above, it is required by the DoE that all schools implement the IQMS model before attention will be given to the respondents' implementation of incentives.

Blase and Blase (2001, p. 123) as well as Steyn and Van Niekerk (2005, p. 169) agree that successful principals determine the appropriate type of reward for the particular situation and the individual teacher. Authors concur that the provision of incentives and a school environment conducive to teacher learning can improve teaching and learning that results in a lasting and positive change (Akbulut et al., 2007, p. 2; Carlson & Gadio, 2002, p. 123; Drago-Severson, 2004, p. 55; Thorburn, 2004, pp. 5 - 6). Respondents indicated that they made use of various forms of incentives such as laptops, bonuses, trophies, diplomas and pens:

- *… once a year at the end of the year we give the teachers a bonus…*[269] (4:456 (105))
- *… teachers who did very very well to come and receive their incentives in front of each and everyone in the hall* (5:422 (109))
- *Normally the incentives would be in the form of being a trophy, a diploma and a pen* (5:423 (109)).

Cowie and Jones (2005, pp. 3 - 6) indicate that laptops have a positive impact on teachers' personal and professional development. Two respondents' agreed that by providing teachers with laptops led to teachers being motivated to use ICT:

- *…everyone receives a laptop, you have everything in your class, you know, I think that is already an enormous motivation…*[270] (3:749 (156))
- *We have given twenty teachers laptops and in twenty classes we installed projectors…*[271] (1:756 (9))
- *… something that is a very big motivator is the satisfaction that they get from using it* [272] (1:791 (89))
- *So the teachers are eager to do this stuff, especially when they hear they are going to receive laptops and screens in their classes, everyone all of a sudden wants to start using the computer, they are extremely inspired* [273] (3:751 (128)).

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[269] *…een keer 'n jaar aan die einde van die jaar vir die ouens so bonussie gee…*
[270] *… ons gee vir julle elkeen 'n laptop, jy kry alles in jou klas, jy weet, ek dink dit is al klaar 'n geweldige motivering…*
[271] *Ons het ook nou vir twintig ouens laptops gegee en in twintig klaslokale data projektors ingesit…*
[272] *…iets wat 'n baie groot motivering is, is die satisfaksie wat hulle daaruit kry as hulle dit gebruik*
[273] *So die personeel is ook honger om hierdie goed te doen, veral toe hulle hoor maar hulle gaan laptops kry, hulle gaan skerms in hulle klasse kry, almal wil ewe skielik wil nou begin rekenaar, hulle raak geweldig geïnspireer*

4.4.3.8   Teacher experience with Information and CommunicationTechnology

Glatthorn, Jones and Bullock (2006, p. 22) indicate: "The key to success lies in how technology is experienced and applied. Monnen and Voogt (1998, p. 100), Knapp and Glenn (1996, p. 31) agree teachers should perceive ICT integration as practical and beneficial as well as become committed users before real integration will take place. Teachers with appropriate experience of ICT, see the relevance of integrating ICT in teaching and learning (Cox et al., 1999, p. 5; Gibson & Oberg, 1999, p. 6; McCain & Jukes, 2001, p. 113; Zheng, 2003, p. 8). Two respondents pertinently indicated that the mere success they experience from the use of ICT potential can motivate teachers:

- *… something that is a very significant motivator is the satisfaction what they get from using it* [274] (1:791 (89))
- *I think the motivation comes once again from what they experience, the success they experience* [275] (1:793 (101))
- *… it is already an enormous motivation to say:"Wow, now I have everything…"* [276] (3:738 (156)).

4.4.3.9   Conclusion

The analysis gave me an indication of the teachers' enabling strategies that had to be implemented to ensure effective and sustainable ICT. The following enabling strategies were identified and showed to have an impact on effective ICT integration:

- Collaboration
- Mentoring
- Inspired and motivated
- Culture of teaching and learning
- Attitude towards ICT
- Community of practice
- Appraisal and incentives
- Experience with ICT.

From my analysis I could conclude the following information with regard to the respondents' implementation of teachers' enabling strategies (Table 4.11).

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[274] *…iets wat 'n baie groot motivering is, is die satisfaksie wat hulle daaruit kry as hulle dit gebruik*
[275] *Ek dink die motivering kom weereens uit dit wat hulle ervaar, die sukses wat hulle ervaar*
[276] *… dit is al klaar 'n geweldige motivering om te sê:"Sjoe hier het ek alles…"*

Table 4.11   Respondents' implementation of teachers' enabling strategies

	Teacher enabling strategies	1	2	3	4	5	6	7
1	Collaboration	X		X		X	X	X
2	Mentoring	X		X	X	X		X
3	Inspired and motivated	X	X	X	X	X		
	Teachers still unmotivated		X		X			
4	Culture of teaching and learning	X		X				
5	Attitude towards ICT	X		X				
6	COP	X		X				
7	Incentives	X		X	X	X		
8.	Experience with ICT	X		X				

Respondents one and three implemented all the teachers' enabling strategies. It was quite alarming to realise that respondents two, six and seven used the minimum teacher enabling strategies. Although respondent two and four indicated that they motivated their teachers they also mentioned that there were teachers at their schools who did not want to make the required ICT integration changes. The principals were unable to create a culture of COP to implement ICT as part of those teachers everyday teaching practice. Teachers do not seem to have enough experience with ICT and do not have the appropriate attitude towards ICT. Therefore ICT will not be effectively integrated into their teaching and learning practices.

4.5   Chapter summary

Chapter four presented an analysis of the data collected from the interviews and field notes. Data were discussed accordingly to three sub-questions (§ 4.1). These sub-questions allowed me to comprehensively study the influence principals have on teachers' ICT integration.

The first sub-question (§ 4.2) gave an indication of how the various principals' influences differ with regard to ICT integration in their schools. It was not only about the principals' leadership and management styles that had an influence but also their attitude towards ICT integration. I perceived that some of the principals were unclear about what constituted the appropriate style. To them it was more about implementing the correct style instead of utilising the most suitable style (§ 4.2.1). Principals perceived the democratic style to be the most appropriate style but literature indicates that leaders should not only apply one style, it is advisable to incorporate a combination of leadership and management styles according to the circumstances in which the principals find themselves. Some principals did not acknowledge the fact they were actually implementing a laissez-faire and autocratic style. The analysis indicated the lack of knowledge concerning the application of the appropriate style led to principals applying styles that would have a negative influence on teachers' ICT integration.

All the principals had laptops to aid them in their leadership of their schools. Although they all indicated the importance of ICT in their daily work, their attitude towards teachers' ICT integration differed immensely (§ 4.2.2). This attitude had an influence on teacher's motivation to use ICT. It is as if they transferred their attitude towards ICT to the teachers. There was a distinguishable correlation between principals' attitudes, words expressed concerning ICT and teachers' motivation to integrate ICT. Principals who showed a negative influence on teachers led to unmotivated teachers that avoided integrating ICT. The influence that principal's have will not only effect teachers but will have far-reaching effects on the ICT culture and COP of the entire school. Principals had to be knowledgeable on issues relating to TPD and ICT to be in a position to aid, manage and direct their teaching corps in the process of effective ICT integration.

The second sub-question determined how principals' strategic thinking influenced TPD for ICT integration (§.4.3). The DoE focus is on the acquisition and upgrading of ICT infrastructure and facilities. Consequently it is up to the principals to initiate, plan and implement TPD for effective and sustainable ICT integration. As a result principals have to strategically think about issues concerning TPD for ICT integration. Such thinking is essential as it assists the principal to determine, plan, direct and incorporate appropriate strategies. Principal's strategic thinking that encompasses the entire teaching terrain; critically thinking about TPD for the integration of ICT, thinking towards the future with regard to the significance of ICT, thinking of methods to obtain goals and thinking about the systems vital for effective and sustainable ICT integration all will have a significant influence on the success of ICT integration. Innovative thinking is especially crucial when principals perceive financial resources to be a barrier that hamper the successful integration of ICT. Limited strategic thinking is related to ineffective principal leadership and management that hinders and prolongs effective ICT integration.

The third sub-question identified enabling strategies to develop and sustain teachers' integration of ICT in teaching and learning (§ 4.4). It is evident that TPD is an important aspect for ICT integration as it gives teachers the opportunity to attain knowledge and skills that will enhance their teaching and learning practices. The principal forms the crucial component to initiate and maintain effective TPD opportunities. Principals provide support in the form of ongoing TPD to sustain ICT integration but when TPD is not maintained teachers will revert to their previous teaching and learning practices. A comprehensive catalogue of enabling strategies was formed that would assist principals in their quest to implement effective TPD for successful and sustainable ICT integration. Most of the principals executed only a few enabling strategies. The more enabling strategies the principals apply the more

success they will have in their efforts to keep up with the demands of education in the 21st century and sustain effective ICT integration in their schools.

Although it is essential that principals apply enabling strategies it is crucial that they clarify and come to grips with the concept of ICT integration. Most principals create opportunities for TPD so that teachers can receive basic training in ICT. Principals are very enthusiastic and impressed when teachers do PowerPoint presentations in their teaching but unfortunately that is not ICT integration. Principals have to pay a lot more attention to create TPD opportunities where emphasis falls on intensive curriculum-based ICT training.

It was quite alarming to see how many principals used the minimum of teacher-enabling strategies. Although teachers are an extremely important factor in effective and sustainable ICT integration it seems also to be the most neglected one. Principals will have to create a culture and COP where ICT integration becomes part of the teachers' daily educational practices where teachers can get experience in ICT, otherwise ICT will remain a component with the **potential** to revolutionise and transform education.

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