

LEADERSHIP FOR SUSTAINING PEDAGOGICAL INNOVATIONS IN ICT IMPLEMENTATION: A CASE STUDY OF A TAIWANESE VOCATIONAL HIGH SCHOOL

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ABSTRACT

This paper is a case study of a vocational high school in Taiwan. The main purpose of the present study is to investigate the key determinants of a school's success in initiating and sustaining pedagogical innovations in Information and Communications Technology (ICT) implementation, with a specific focus on the effect of leadership approaches in the change process. Centring on a particular vocational high school, this study examined the way in which the entire staff succeeded in transforming a traditional school into an acknowledged ICT-capable school. Questionnaires and interviews served as the main research methods within this study. The results confirmed that, first, collaborative leadership was at the core of successfully managing changes of ICT integration. Second, the findings highlight the importance of fostering the future leaders for sustaining good practices of ICT implementation. Finally, the findings reflect upon the potential impact of the leadership approaches on teachers' engagement in the change process of ICT implementation. Currently, there is still limited research focusing on schools' sustainability of ICT implementation. The present research could serve as a reference for further research in this regard.

KEYWORDS

Collaborative leadership, sustainability, pedagogical innovations, ICT integration.

1. INTRODUCTION

The introduction and extension of the use of Information and Communications Technology (ICT) has been of concern in the educational field over recent years, as can be evidenced by studies of change management and ICT integration in schools internationally (e.g. Wong & Li 2006; Owston 2007). It is evident that the aim of implementing educational change of introducing and extending the use of ICT in classes is to improve the existing teaching practices. However, the processes of managing pedagogical innovations involving ICT in a school context are usually fraught with difficulties in practice in many other countries (Owston 2007). That is, whilst the significance of ICT in education is acknowledged, practical challenges of successfully integrating ICT into the curriculum in school settings also arise. More specifically, the studies concerning successful ICT implementation in schools identify that the key and shared attribute of these schools lies in the joint lead and active involvement of the headteacher and other staff members in leadership positions in the change process of ICT development (Tearle 2003; Sheppard 2003). Notably, however, even though new teaching approaches are adopted in classroom practices at the initial stage of the change process, very few are able to become sustainable and institutionalised (Hargreaves & Fink 2006). Furthermore, it is generally accepted that making pedagogical innovations concerning ICT is more complicated than managing changes in many other subject areas (Fox 2003).

Given the above context, the main purpose of the present study is to examine the key determinants of a school's success in managing and sustaining pedagogical innovations in ICT implementation, with a specific focus on the effect of leadership approaches in the change process. Centring on a specific vocational high school in Taiwan, this study examined the way in which the entire staff succeeded in transforming a traditional school into an acknowledged ICT-capable school. Thus, the findings can show the patterns of the leadership processes of managing pedagogical innovations in ICT integration in school settings in Taiwan.

2. LITERATURE REVIEW

2.1 Sustainability of Educational Change

Sustainability of educational change typically refers not only to the durability of reform movements in school settings, but also to the fact that whether these movements can be scaled up or spread from a few schools to the entire educational system (Combs 2007; Fullan 2006; Hargreaves & Fink 2006). Therefore, these authors perceive sustaining changes and innovations in education as a much tougher and more complicated undertaking than simply maintaining educational shifts over time. For Hargreaves and Fink (2003), sustainable educational change in schools has five critical and interrelated features below: (1) its processes and effects are deep, broad and durable; (2) it supports continuous learning and knowledge sharing for benefiting everyone in the educational context, and thus, it does not profit simply a few individuals by means of partial changes and improvements; (3) it is upheld by accessible human and material resources, and it develops and renews its resource base; (4) it does not result in any negative impact on its surrounding environments; and (5) it promotes diversity and emphasises the importance of learning from differences through collective efforts for constructive debate and reflective evaluation.

From the perspective of systemic transformation, Fullan conceptualises sustainability of educational change as ‘the capacity of a system to engage in the complexities of continuous improvement consistent with deep values of human purpose’ (Fullan 2005, p. ix). Based on the above conceptualisation, capacity-building for educational change should focus not merely on the school/community level, but on the district level and the state/central government level as well (Fullan 2005). Apart from the above advocacy of large-scale and deep reforms at all levels, the remaining interconnected elements which Fullan considers fundamental for sustainable educational change are as follows: (1) starting educational change with moral purpose; (2) enhancing whole-school capacity for educational change by developing learning networks and communities across different schools; (3) developing systemic accountability both by building vertical relationships between the central government and school districts, and by enhancing cross-level communicative avenues; (4) forming a prevailing culture of deep learning for coping with endless challenges in the processes of educational change; (5) pursuing both short-term and long-term results for achieving system-wide and lasting changes; (6) a cyclical mode of two counterbalancing forces – activity and rest – is the component for stepping into successful systemic change in education; and (7) sustaining educational change requires continuation of adequate leadership capacity which is built throughout the organisation at all levels of the system. Notably however, while stressing the importance of deep and large-scale reform of the holistic educational system, Fullan (2005) views successful leadership at the school level as the primary and essential bedrock of integrating the above requirements for sustaining educational change into school contexts. Indeed, although noting the potential impact of a school’s surrounding environments on the sustainability of educational change, Hargreaves and Fink (2006) still highlight the fact that leadership capacity within a school is the radical determinant of continuity or discontinuity of educational change.

It is evident that Fullan, Hargreaves and Fink argue sustainability of educational change from different perspectives; however, they reach a consensus that the ways in which schools react to reform agendas generally decide whether or not educational innovations are able to continue and become system-wide. Their common opinion raises the question of the way in which schools develop their capacities for acting positively and effectively on continuous reform movements. Like Fullan, Hargreaves and Fink, other researchers’ shared response to the above question is that schools must become learning organisations which cultivate staff collaboration and continuous professional development (Combs 2007; Leithwood 2005). These researchers’ arguments also echo the advocacies by Fullan, Hargreaves and Fink that effective school leadership is the core of building school capacity for coping with changes, and that developing sustainable school leadership is the fundamental and key strategy for sustaining educational change and improvement.

2.2 School Leadership for Sustaining Good Practices

‘Setting directions, redesigning the organisation and developing people’ are identified by Leithwood and Riehl (2003) as the crucial principles of successful school leadership. In his later international studies, Leithwood (2005) goes further, verifying ‘developing people’ as the key determinant of making good practices durable and wide-spreading in the educational context. For Leithwood and Riehl, the principle of developing people concerns the following areas: (1) providing intellectual stimulation; (2) emphasising individualised needs and professional learning; and (3) setting appropriate models which are consistent with the school’s values and goals. The successful headteacher supplies professional training to enhance teachers’ skills, and created a school culture which nourishes the constructive debate and open evaluation among staff.

The initiation of school change usually requires teachers’ sufficient competency for adapting themselves to reform and their aspiration for educational improvement (Fullan 2001). Importantly, the encouragement and support from the headteacher could be the main force for driving teachers to participate in continuous professional learning. In their case studies across different schools in England, Leithwood and his colleagues found that all headteachers had a strong and positive impact on the staff’s motivation, commitment and beliefs about the supportiveness of their working conditions (Leithwood et al. 2006). They concluded that the headteacher is the crucial supporter for staff to develop their personal mastery in embarking on school change. More specifically, successful headteachers are able to lead staff in considering the values and reflecting upon the action for new educational agendas in a critical and constructive way (Leithwood et al. 2006).

The studies of sustaining educational change in schools address that the value of teachers’ collaborative learning lies in showing their respect for and learning from individuals’ diversity (Fullan 2006; Hargreaves & Fink 2006). It is for these reasons that the headteacher’s and other senior leaders’ prompt mediation of turning conflicts among staff members into productive discourse and discussions is particularly imperative in the organisational processes. That is, without the competent headteacher and other senior leaders to manage the conflicting tensions among staff members, individuals’ diverse opinions and critical dialogue cannot be beneficial, but fragmented or even harmful for people who work together in pursuit of school change and improvement (Fullan 2006). Moreover, educational policies are usually overload and fragmented, and this can result in disturbance as schools are asked to carry out educational change (Fullan 2001; Hargreaves 2002). Even so, teachers’ resistance to implementing and sustaining educational change can be diminished, when the headteacher enlarges the school’s capacity by supporting teachers in both rational and emotional ways (Fullan 2001). It would appear that the problems with educational policies can cause teachers to struggle with managing school change. However, compared with external factors, the internal factor – the way in which the headteacher shapes the common values among teachers – tends to be more influential to educational reform within the school context.

It was also worth noting that continuation of developing leadership talent on the staff and collaborative leadership are usually treated as the critical components of successfully initiating and persisting in good practices (Fullan 2006; Hargreaves & Fink 2006). As with these authors’ work, the studies of school leadership for change management consistently reinforce the powerful impact of leadership distribution to teachers on continuous improvements in teaching practices (Spillane 2006). More recent international research of ICT integration in school settings also verified staff collaboration in the leadership processes as the key to a school’s sustainability of implementing ICT (Owston 2007). Corresponding to Owston’s research, the studies concerning school change of ICT implementation in Canada (Sheppard 2003), England (Tearle 2003) and Hong Kong (Wong & Li 2006) revealed that the tasks of pedagogical innovations in ICT integration should not be put on the shoulders of one particular school leader, but be appropriately distributed to the staff at different levels if educational change of ICT integration is to be successful and sustainable.

All the above studies could be summarised as saying that if school-wide pedagogical innovations are to be successful and sustainable, school leaders are required to take the responsibilities for nurturing the potential leaders on school staff and for making a wholesale shift in teachers’ attitudes towards the reform movement. In other words, not only the formal leaders’ high commitment to ICT development, but other staff members’ joint contribution to the leadership processes of implementing ICT is also fundamental for managing whole-school and enduring pedagogical innovations in ICT adoption.

3. METHODOLOGY

In the methodological literature, many authors have made similar comments that mixing quantitative and qualitative approaches in the same research design is feasible (Robson 2002). Moreover, incorporating quantitative and qualitative research approaches and methods into a single study is particularly instrumental for further exploration of social phenomena (Denscombe 2003). Owing to the usefulness and feasibility of combining both quantitative and qualitative approaches in one study, a mixed-method approach was used within the present study for investigating the target school's leadership approaches to pedagogical innovations in ICT integration. Purposeful sampling was applied to ensure that the school selected for this research was an information-rich site. The target school was a publicly acknowledged ICT-capable vocational high school and evaluated by the government as being qualified for continuing running the change project concerning pedagogical innovations of ICT integration. Findings presented in this paper were collected through questionnaires and semi-structured interviews. The questionnaires were distributed to 30 teaching staff and a total of 25 returns were achieved; the return rate was 83%. All the respondents to the questionnaires were asked to give their answers by registering on a six-point bipolar scale ranging from 'very strongly agree' to 'very strongly disagree'. The levels of 'very strongly agree', 'strongly agree', 'agree', 'disagree', 'strongly disagree' and 'very strongly disagree' were translated, respectively, into the scores 6, 5, 4, 3, 2 and 1 in the process of data analysis. As regards the follow-up interviews, data was gathered from a total of 19 school staff, including the headteacher, the director of academic affairs, the ICT coordinator and 16 teachers.

4. FINDINGS

4.1 Findings from the Questionnaires

Statements presented in the questionnaires were designed for examining the staff opinions on their leadership approaches to managing school-wide pedagogical innovations in ICT adoption in the existing teaching practices. Totalling all questionnaire responses to the statements, nearly all (97%) fell within three levels from 'agree' to 'very strongly agree', with an overall mean of 4.52 (at the level of 'strongly agree').

In analysing all answers in detail, two statements were rated particularly highly. One of the statements was 'there is coordinated action across the staff at all levels in the leadership processes of pedagogical innovations in ICT integration'. The other statement was 'there is a good approach to developing teachers' leadership potential for managing school changes and improvements in ICT integration'. According to the findings, general overviews of all responses to the two statements were classed as the level of 'strongly agree'. The former statement attracted 100% positive responses, over half (52%) of which fell within two levels from 'very strongly agree' to 'strongly agree'. In addition, this statement received the top individual mean of 4.56. On this basis, there seemed to exist collegiate work patterns in leadership practices of undertaking pedagogical innovations in ICT integration. As regards the latter statement, nearly all responses (96%) were positive and around half (48%) fell within two levels from 'very strongly agree' to 'strongly agree'. This statement was ranked the second highest in the list of individual means. This result reflected that most staff agreed with their in-house mechanisms for cultivating the talented individuals as their future leaders in the domain of ICT developments. Compared with the above statements, the statement concerning teachers' satisfaction with the overall approach to school leadership for pedagogical innovations in ICT integration was ranked slightly lower. Even so, the general overview of the responses to this statement was still relatively positive, with a 96% approval rating. Therefore, it can be said that nearly all staff subscribed to the shared views that their overall approach to school leadership was satisfactory, in terms of undertaking pedagogical innovations in ICT integration.

Based on these figures, there was a strong tendency reflecting that the teachers' opinions on their leadership approaches to implementing ICT across the curriculum were positive. Furthermore, it can be assumed that school leadership for pedagogical innovations in ICT adoption was not restricted to a limited staff in leadership positions or with specifically strong skills in ICT at the implementation stage of ICT development.

4.2 Findings from the Interviews

4.2.1 Collaborative Leadership Approach

Corresponding to the questionnaire results, a particularly strong theme which emerged in the interview phase was that the teachers generally felt pleased with working together and getting involved in leadership practices of implementing pedagogical innovations in ICT integration. All teachers who were interviewed expressed the same views, arguing that their school leadership was not treated as the prerogative of any individual staff. In the interviews with the teachers from outside the leadership team, their common opinions were that they were becoming increasingly comfortable with taking the leadership role in the processes of school-wide pedagogical innovations in ICT integration. An inexperienced teacher, for example, appreciated that:

This school is like a family and the morale is very high...Although I was not in the leadership team, many teachers, including formal leaders like the ICT coordinator and directors, invited me to join their team discussion and decision-making processes...It was really heart-warming that everyone here tried making me feel accepted.

In the interviews with the headteacher, he claimed that:

Without the continuous and joint efforts of the director of academic affairs, the ICT coordinator and other teachers in carrying out school-wide pedagogical innovations, it would have been almost impossible to allow our school to have today's outcomes.

Speaking of the key drivers for the staff collaboration and active engagement in school leadership for pedagogical innovations in ICT integration, all teachers in the interview phase claimed that the headteacher was in the central role in shaping a school culture within which individual staff became used to coordinating with each other in undertaking the leadership tasks of promoting ICT integration. More specifically, the responses from all teachers reached the similar comments, highlighting the fact that shouldering the leadership tasks offered them more opportunities of working closely with senior and middle leaders in proposing and revising the strategies for making new practices fit well with the existing classroom practices. The teachers, therefore, felt that getting involved in the leadership activities strengthened their confidence in conducting new teaching practices of ICT adoption.

4.2.2 Development of Future Leaders

In the interview phase, the staff expressed their positive views on the question about their in-house mechanisms for developing teachers' leadership potential to implement ICT. For all teachers in the interviews, the school's initial and current achievements in ICT implementation lay in the headteacher's good appointment of the suitable teachers as the key leaders for whole-school development in the field of ICT education and its application. All teachers made the similar comments, stating that their ICT coordinator was very ICT-focused, highly-committed and had sufficient interpersonal skills. For example:

Our ICT coordinator is very enthusiastic about helping us out whenever we have trouble with the computer. He is like our total guide with ICT.

Our headteacher is quite visionary and has well-targeted development plans for managing human resources...He selected 'the right person' as the ICT coordinator. I think this is the important base for our school's outcomes of ICT implementation.

In addition to good designation of the key staff in the very beginning of the change process, the headteacher's investment in fostering the future leaders for sustaining ICT implementation was the crucial issue which was raised frequently and positively in the interview phase. Apart from this, it was worth noting that the strong support from another formal leader – the director of academic affairs – in the overall course of developing individuals' potential to manage school changes in ICT adoption. This is because when praising the headteacher's efforts to cultivate leadership abilities of individual staff, the teachers also highlighted the director of academic affairs' hands-on approaches to leading others by examples. As can be seen in the teachers' replies:

The director of academic affairs eased our nerves by showing us the practical strategies for leading others and managing the project...I think that he is really competent for "leading us to understand how to lead"

I think both the headteacher and the director of academic affairs are very supportive for what we do...The headteacher allows us to exert leadership in the field which we are familiar with...The director he coaches us by showing how to do and how to make things better. I think he is an excellent, a very approachable leader.

In the interview with the director of academic director, he said that:

I've never seen making whole-school pedagogical innovations as an easy job...Of course, making effective change is even more challenging...However, being a leader, you need to do your best to comfort teachers' nerves...It is my belief that you need to show them the way how to embark on new projects and share some experiences with them in advance.

Based on the above interviewees' responses, it was evident that in order to construct the supportive conditions of implementing and sustaining pedagogical innovations in ICT integration, the headteacher invested much energy in identifying the competent individuals as the core leaders at the very start of the change process. Apart from this, the headteacher and the director of academic affairs both provided adequate support for the ICT coordinator in the aspect of nurturing and renewing human resources within the school throughout the change process. Moreover, it was encouraging to note that for those from outside the leadership team, getting involved in leadership practices was perceived to be beneficial for future career plans. The positive feelings about exercising leadership in the change process seemed to motivate the staff to become more willing to participate in leadership activity involving ICT implementation.

4.2.3 Perceived Values in Pedagogical Innovations

In analysing the interview data, 94% of the teachers approved their school leadership for managing changes of ICT integration without dissent. When further explaining why they felt satisfied with the overall approach to school leadership for pedagogical innovations in ICT integration, the interviewees' responses can be divided into two key points. First, the success in gaining official recognition of initiating and continuing the change project allowed the staff to receive more support from the government to develop and improve the ICT-integrated instructional modes. This, in turn, yielded the benefits for the teaching and learning processes. Second, the school's image and competitive capabilities improved throughout the course of whole-school developments in new practices of ICT application. In the interviews, the teachers claimed that:

We felt exhausted at the very beginning of undertaking the change project of ICT integration, but now we're at a point that we are proud of being part of the staff here...Our neighbouring schools know that integrating ICT into the curriculum has become the key feature of our school. We enjoy a good image within our school community.

The overwhelming majority of the teachers (94%) also considered their leadership approaches to be successful in nearly every aspect of handling pedagogical innovations and developments, not simply in the aspect of implementing ICT across the curriculum. Moreover, the interview results showed that, when noting the things which the school could change and improve, the teaching staff were keen on giving their voice in the staff meeting or even proposed their ideas directly to the headteacher or other formal leaders.

5. DISCUSSION

With respect to the leadership approach to managing changes of ICT implementation, it was evident that leadership tasks of maximising the use of ICT for teaching purposes were fulfilled through considerable synergies and interactions of many staff members, irrespective of post or ICT expertise. That is, there seemed to exist a distributed form of leadership approaches to implementing ICT in the target school. The evidence reinforced the conclusions of the related studies (Wong & Li 2006) that teachers' coordinated actions and active engagement in the leadership processes were at the heart of making school-wide pedagogical innovations in ICT integration successful and durable. The findings also resonate with Tearle's case studies

(2003) that teachers' collaboration in shouldering leadership responsibility in the change process was at the core of enlarging their school's leadership capacity for continuing pedagogical innovations in ICT implementation. The findings also support Leithwood's (2005) international multi-case studies that teachers' intense involvement and close collaboration in leadership activities were found to be essential for effective leadership which brought about successful changes and improvements in school settings in nearly all educational contexts. Importantly, teachers in the target schools generally accepted their collaboration and collegiality in the leadership processes of implementing ICT as a natural and an important part of their work routine. To a certain degree, the findings echoed Sheppard's multi-case studies (2003) that the predominant determinant of the schools' success in continuing new teaching practices of ICT integration was teachers' awareness of the necessity and value of their collaboration in leadership practices.

In the aspect of developing school staff for sustaining ICT implementation, the findings showed that the headteacher's comprehension of the staff's quality, together with good designation of the key leaders, seemed to be essential for success in planning and initiating whole-school ICT developments. The evidence gathered here was parallel to the related studies focusing on implementing school-wide changes in pedagogical innovations regarding ICT adoption in Canada (Sheppard 2003), England (Tearle 2003) and Hong Kong (Wong & Li 2006). Despite differences in their educational contexts, these studies subscribed to the same views, arguing that identifying and developing the competent teacher as the ICT coordinator (or the 'technology teacher' in Sheppard's terms) was the foremost requirement for bringing about the initial success in the change process of school-wide ICT adoption. Notably, both the headteacher and another senior leader (e.g. the director of academic affairs) continued nurturing the potential staff as lead teachers in the ICT field. Moreover, echoing the literature on sustainable leadership and school change, the results from this study reflected that the headteacher's competence in identifying and continuing fostering individuals' leadership potential may function as the primary base for making the initial success in school change become durable (Fullan 2006; Hargreaves & Fink 2006). In a sense, it would appear that only with the long-term plans and systemic strategies for enhancing leadership capacities of many staff members can a school have sufficient capacity for moving the change and improvement efforts beyond the initial success to the continuation phase.

As for teachers' perception of pedagogical innovations, it was encouraging to note that the interviewees generally approved their school leadership for managing changes of ICT integration without dissent. Apart from this, the teachers considered their leadership approaches to be successful in nearly every aspect of handling pedagogical innovations and developments, not simply in the aspect of implementing ICT across the curriculum. More specifically, when noting things which the school could change and improve for better, the teachers were keen on giving their voice in the staff meeting or even proposed their ideas directly to their formal leaders. On this basis, an overarching message which emerged in the school was that the rationale for the teachers' high praise for their school leadership lay in their strong awareness of the ongoing and whole-school progression throughout the change process. Based on the findings, it could be inferred that one of the radical impulses for school staff to continue moving the existing success in ICT implementation forward was that the school fostered a dominant culture within which people held a high-level commitment to striving for excellence. That is, teachers' awareness of the necessity for school change underpinned their intentions to keep improving in ICT implementation even when challenges occurred. The findings correspond to the literature that school staff are usually willing to undertake change and development when feeling a critical need for doing so (Fullan 2001).

6. CONCLUSION

Despite a small number of research participants in the present study, the combination of quantitative and qualitative approaches provides insights into school leadership for managing pedagogical innovations in ICT implementation. The factors which affected the school's sustainability of pedagogical innovations in ICT implementation are inter-related rather than discrete. Yet, it would appear that collaborative leadership is at the core of supporting whole-school change and improvement in this regard. In addition, the results show that a school's capacity for sustaining ICT implementation entails not only good designation of the suitable staff as the key leaders at a very start, but also ongoing development of the potential teachers' leadership abilities. The findings also identify the impact of school leadership on teachers' perceived values in pedagogical innovations which, in turn, affects their participation in change management concerning ICT implementation.

It is inevitable that the findings from one case-study school limit the possibilities for generalisation. However, little research is undertaken to examine the change process focusing exclusively on school leadership for sustaining good practices of ICT integration. It is anticipated that the findings from this study can shed light on the approaches to managing and sustaining pedagogical innovations in ICT integration. Thus, it is expected that the result of the present research, on the one hand, contributes to illuminating the potential factors which facilitate sustainability of school change and improvements involving ICT adoption. On the other hand, it can extend knowledge in the field of school leadership for change management regarding ICT implementation.

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