

Growth of Empowerment in Career Science Teachers: Implications for Professional Development

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Abstract

The purpose of this research is to identify those pivotal experiences of career science teachers that have promoted their advancement along the teacher professional continuum. The research uses behavior over time (BOT) graphing to capture the empowering professional growth opportunities teachers recall experiencing over the entire course of their careers and looks for patterns in those teacher experiences. The study proposes that the professional development offered to teachers should recognize and address their needs and increase their sense of empowerment. This research is specifically focused on the NSF Teacher Professional Continuum program goals of encouraging research on effective professional development models and on advancing the knowledge base on enhancement and retention of STEM teachers.

1. Objectives or purposes

Much of the recent education research has focused on new teachers and why large numbers of teachers are leaving the profession (Ingersoll and Smith, 2003). Few studies have concentrated on experienced teachers in an attempt to identify factors that may have contributed to their retention.

The researchers in this study used techniques of narrative inquiry, as well as behavior over time (BOT) graphing, to capture the experiences fifty teachers identified as having positively or negatively impacted their feelings of empowerment. The purpose of this research is to identify those pivotal experiences of career science teachers that have promoted their advancement along the teacher professional continuum and have helped them to persist in their careers. For the purposes of this paper, the researchers investigate one particular dimension of empowerment – *professional growth* – as it is related to overall empowerment and is (occasionally) nurtured by professional development.

2. Perspective(s) or theoretical framework

What is empowerment and why is it important? Though the term empowerment is used frequently in contemporary educational discourse, no one accepted meaning is shared among all educators. However, some common themes are emerging in the literature. Empowerment is most often viewed as a process through which people become powerful enough to engage in, share control of, and influence events and institutions affecting their lives. In part,

empowerment requires that people gain the knowledge, skills, and power necessary to influence their lives and the lives of those they care about.

Short (1992) presented six empirically derived dimensions underlying the construct of teacher empowerment – autonomy, self-efficacy, decision-making, status, impact, and professional growth. These dimensions were based on the definition of empowerment as “a process whereby school participants developed the competence to take charge of their own growth and resolve their own problems.” In this study, empowerment was specifically defined as, “the opportunity and confidence to act upon one’s ideas and to influence the way one performs in one’s profession” (Melenyzer, 1990).

Research has attempted to link empowerment with both teacher retention and student achievement. The importance of teacher empowerment was summarized by the Center for Teaching Quality’s (1995) report, *Teacher Working Conditions Toolkit*, as follows:

The importance of teacher empowerment in key education areas cannot be underestimated. A belief by teachers that their knowledge of teaching and learning (and the very students they teach) matters and is considered a valuable factor in decision-making, can connect them to their schools and districts in powerful ways. This connection can help improve the retention of those teachers in their classrooms and, ultimately, the success of the students they teach.

If teacher empowerment is vital to effective schools, then it is important to know how it develops and how it can be nurtured. Short (1992) called empowerment a complex construct (p. 7). Vogt and Murrell (1990) described empowerment as a dynamic process, and Liden and Tewksbury (1995) discussed it as occurring on a theoretical continuum. Yet, researchers have not thoroughly examined empowerment to this level of complexity. To do so requires consideration of how the component parts that embody empowerment (its dimensions) interact within the environment of teachers’ lives.

3. Methods, techniques, or modes of inquiry

In this study, data collection was accomplished through the use of one-on-one interviews (Clandinin & Connelly, 2000) in conjunction with the Systems Dynamics (Anderson & Johnson, 1997) technique of utilizing behavior over time (BOT) graphs. Fifty teachers were selected for the study based on demographics, recommendations by science educators and administrators, and longevity in the classroom. These teachers graphed their highs and lows of empowerment as they described in detail those pivotal events that caused them to feel empowered (or un-empowered) over the course of their careers. Parallel graphs were then constructed for each of the six dimensions of empowerment as defined by Short (1992). The researchers categorized later teacher experiences, identified patterns, and examined the data for congruence with the growth of empowerment model developed by Hobbs (2004) during a previous study.

4. Data sources or evidence

Hobbs’ (2004) original research consisted of fifteen case study interviews with teachers who had from 12 to 31 years of science teaching experience, using strategies taken from both

narrative inquiry and systems dynamics. Teachers in that earlier study also drew behavior over time graphs while telling their stories of empowerment, which were audio-taped and later transcribed. Although the similarity of experiences among the teachers was striking, the sample size was too small and the participants lacked sufficient diversity to generalize. The current research, the NSF-funded *Project Instrument Development*, duplicates the techniques used in the original study with a larger and more diverse sample of fifty teachers with 7 to 38 years experience from rural, urban and suburban schools. This group closely resembles the demographic makeup of Texas science teachers statewide.

5. Results and/or conclusions/point of view

Phases of Teacher Empowerment

While the dimensions of empowerment can and do appear at any time during a teacher's career, there was a relatively consistent pattern as to the order of introduction of the types of events the teachers described. Therefore, one could infer the sequence in which the dimensions emerged and evolved. For organizational purposes those phases are discussed as the following: *Phase 1: Initiating Empowerment*, *Phase 2: Growth of Empowerment*, and *Phase 3: Sustaining Empowerment* (see Figure 1 for an illustration of these phases).

For the teachers in this study, the initiating phase lasted approximately three years. The subsequent five or so years, labeled *Growth of Empowerment*, were periods of growth supported by professional development opportunities and, despite personal challenges and difficult teaching situations, resulted in an overall increase in empowerment. By the ninth or tenth year, some of the teachers were struggling to sustain their sense of empowerment whereas others had found collegial relationships within or outside the school that promoted their sense of empowerment.

Phase 1: Initiating Empowerment (Years 0-3)

As the teachers pondered their earliest experiences in the classroom, stories with consistent themes and similar terminology emerged. Their storylines centered on the following experiences:

- Lack of preparation for entering the classroom and concurrent lack of awareness of professional development opportunities
- Early experiences with decision-making
- Increasing confidence that accompanied student success

For the purposes of this paper, the researchers focus on one critical element, Preparation of Instruction, as it relates to overall empowerment.

Critical Element: Preparation for Instruction. Almost every teacher, while reflecting on the empowerment graph, commented about a lack of preparation for entering the classroom. Cheryl, for example, pointing to the lower left hand corner of her graph, gave an indication of her level

of empowerment as zero, “Okay, that’s [me] coming out of college there at the beginning. You think you know everything, but you really don’t.”

Most teachers also volunteered that for the first two or three years they were unaware of professional development opportunities that would have helped diminish their deficiencies. According to David, “Part of what changes during a career is your awareness of these opportunities. I’m certain there were opportunities my first year. I just knew nothing about them.”

Phases of Empowerment

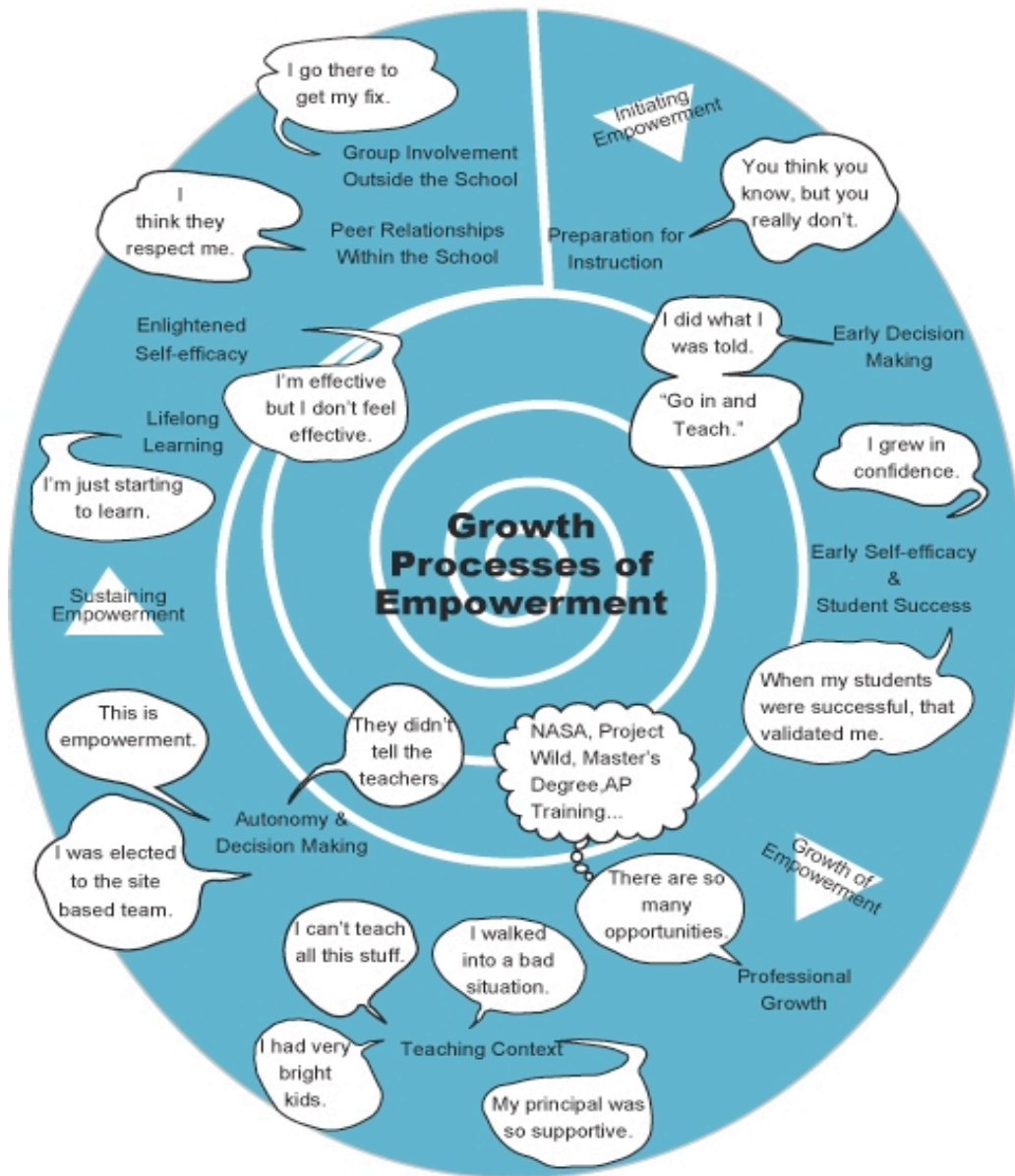


Figure 1: Phases of empowerment.
Adapted from Senge's *The Dance of Change*, p. 28.

Phase 2: Growth of Empowerment (Years 4-8)

After the first three years, teachers became more aware of and involved in school life and professional opportunities outside their classrooms. Their empowerment graphs climbed during this period of time, and their stories echoed their growth in feelings of empowerment. The major storylines included:

- Growing awareness of professional development
- Increasing self-efficacy through student success
- Challenging contexts — both teaching and personal
- Maturing sense of autonomy through involvement in decision-making

For the purposes of this paper, the researchers focus on one critical element, Professional Growth Opportunities, as it relates to overall empowerment.

Critical Element: Professional Growth Opportunities. Preparation for Instruction continued to be important as teachers grew in their feelings of empowerment. However, in this career phase, the teachers began to seek professional growth opportunities designed to improve their instruction. Donna described her experiences as follows:

When I first started out I would attend just regular (school district) staff development. Once I began to start attending the AP Institutes that had to do with what I was teaching, I felt like ‘This is going to make my job so much better.’

Phase 3: Sustaining Empowerment (9+ Years)

Around Year 9, many teachers’ feelings of empowerment peaked and then leveled off, as evidenced in David’s Empowerment graph shown in Figure 2.

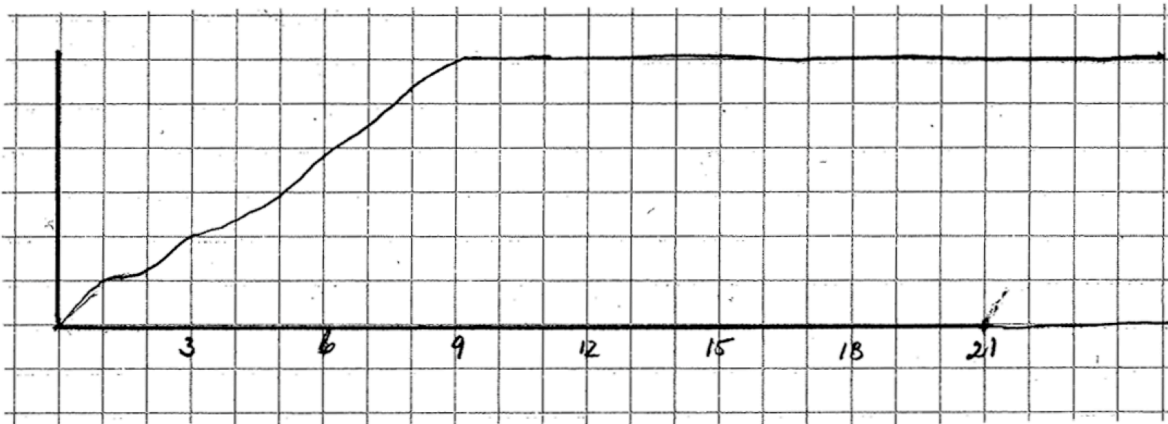


Figure 2. David’s Empowerment Graph

Whether these teachers were considering leaving the classroom at that point, or whether they continued as classroom teachers for years afterward, they indicated little change in their sense of empowerment. Or, another and more positive interpretation was that by year nine most of these teachers considered themselves to be fully empowered.

Several teachers mentioned at this point a change in feelings of effectiveness, as measured by the degree of success their students were experiencing. However, their self-definition of what constituted effectiveness for themselves tended to be complex. Also, during this phase of their career, the teachers valued learning both for themselves and for their students very highly, and they sought meaningful collegial relationships within and outside the school setting. Storylines during Phase 3 focused on the following:

- Appreciating lifelong learning
- Redefining self-efficacy
- Valuing relationships with peers
- Impacting education through group involvement

For the purposes of this paper, the researchers focus on one critical element, Professional Growth and Lifelong Learning, as it relates to overall empowerment.

Critical Element: Professional Growth and Lifelong Learning. As the teachers became more experienced, they continued to pursue professional development opportunities, but the motivation for and means of professional development appeared to have changed. At this phase of their careers, many teachers were achieving professional growth through interactions with scientists and other professionals. The experiences they sought focused more on content acquisition rather than on pedagogy and instructional techniques. Some were involved in instructional design and curriculum development, and several were presenting their work at conferences and/or training other teachers.

Experienced, empowered teachers take learning seriously, both for themselves and students, as several of the teachers indicated. Comments about the importance and satisfaction of learning were common during the interviews. Sara loved teaching and believed she could stay in the classroom forever. She commented, “I’m still learning. That’s one thing I will say – If you quit learning, it’s not any fun anymore.” Sara’s sense of self-efficacy, nourished by learning and sharing that learning with her students, empowered and sustained her career.

Many teachers looked outside the school for events or groups, initially for professional growth opportunities, but consequentially found permanent collegial support, which accorded appreciated boosts in status, as noted by Nancy who recalled:

Since '92, I have worked at NASA and I have worked with very, very, very bright, intelligent, super smart engineers, scientists at NASA and they put teachers on a pedestal. I’ve been at Kennedy Space Center, JTL, and Johnson Space Center, doing workshops and writing curriculum for them and wherever I have gone and there have been NASA people there, I am the one that they think is so phenomenal. And it's such a fabulous feeling to know that at NASA, with all those magnificent people there, that they think that teachers are more important.

Finishing up her graph, Nancy concluded, “Way up here [at the top of the graph], I feel very special. And I say every year, ‘I’m going to go to NASA for my fix so I can get my self-esteem boosted and I can go back to the trenches.’ So there you are.”

The teachers in this study exhibited remarkable resiliency in maintaining their overall sense of empowerment with professional development providing needed support for the growth process. In the end the most empowered teachers found ways to work inside and outside the school system to increase both status and impact.

Experiences and Patterns

Analysis of the interviewed teachers’ transcripts and graphs revealed the following influential experiences and patterns in the development of empowerment as related to professional development opportunities:

- Professional growth provided the “mind” – an intellectual remedy for lack of preparation for teaching and challenging teaching contexts – and eventually supported a mature sense of self-efficacy, which was reflected in teachers’ increased confidence in their teaching, involvement in decision-making, and their status as professionals.
- The professional development needs of the teachers varied as their careers progressed and the context of their assignment changed.
- The stories told by the teachers as they interpreted their graphs did not reflect a need or quest for control over schools, but focused primarily on their quest for effectiveness as teachers, their need for targeted professional development, and the importance of collegial relationships.

6. Educational or scientific importance of the study.

Reaffirming and Extending Short’s Research

This study confirmed the roles and identified the relationships of the six dimensions of empowerment (autonomy, decision-making, impact, self-efficacy, status, and professional growth) identified by Short as they evolved in the contexts of teachers’ experiences. Although complex in their interactions and subject to the causal loops of systems dynamics, the dimensions did, nevertheless, appear and mature in an identifiable sequence. Evidence concerning the appearance and maturation of these dimensions should be considered in making decisions in regard to how the talents and effectiveness of teachers can be enabled and maximized.

A model emerged that conceptualized the teachers’ experiences and their perceived growth in empowerment. The model shows empowerment as a growth process with three phases of development: The Initiating Phase, The Growth Phase, and the Sustaining Phase. Similar dimensions or constructs characterize each phase. However, the dimensions become increasingly complex and sophisticated, and reach maturity during the third phase as reflected in the following summaries.

- During the Initiating Phase (Years 1-3) teachers recalled struggling with their lack of preparation yet growing in confidence as they practiced their craft in their classrooms. Their time was devoted to learning what to teach and how to teach it.
- During the Growth Phase (Years 4-8) teachers recalled becoming more aware of professional development opportunities. Their growing feelings of self-efficacy were supported by real evidence of student success. They were challenged by the teaching context – students, principals, and working conditions. They began to be involved in decision-making groups and took on leadership roles.
- During the Sustaining Phase (Year 9 and beyond) these teachers saw learning as a lifelong process. They felt admired and respected and were impacting education on and off campus. They had strong connections with organized groups and they were redefining their own sense of self-efficacy. However, by year 9 the teachers’ graphs all showed a “leveling off” of empowerment. Typically, their sense of empowerment was sustained, but their growth was stalled. It was apparent that the most mature teachers needed different and tiered professional development programs if their sense of personal and organizational empowerment was to continue to develop.

Creating the Conditions for Initiating, Increasing, and Sustaining Teacher Empowerment

Results of this study support the implementation of tiered professional development opportunities for teachers. The developmental needs of teachers in Phase 1 are vastly different than those in Phase 3. Yet, most school systems take a one-size-fits-all approach to offering growth opportunities to its professional staff.

During the first three years of employment new teachers should be supported as they learn the logistics of being a classroom teacher. Teachers in this study reported that peer assistance facilitated this process. However, this assistance was often incidental and not always available when needed. The stories of these teachers, as well as those of many others, provided a convincing argument that an organized and systemic mentoring program is needed for teachers in Phase 1. Furthermore, new teachers should be directed toward targeted professional development opportunities that address individual needs and/or weaknesses. The process of becoming competent and efficient classroom teachers overwhelms new teachers. Any demands on their time in response to their needs should be carefully structured so that outcomes are related to the challenges they are encountering at this phase of their career.

Professional development during Phase 2 should assist teachers in becoming more effective in designing and delivering instruction that meets the needs of their particular student population. This study indicated that teachers in this phase have concerns about their self-efficacy, or instructional effectiveness in terms of student achievement. Professional development should capitalize on this concern. Also, many teachers in this study found areas of strong interest during this phase that later became the professional focus for their collegial connections beyond their classrooms.

Thus, it is important that teachers be encouraged to sample a variety of professional development offerings and pursue individual interests and needs. Furthermore, teachers in this phase were becoming involved in leadership activities and roles. These leadership roles enhanced their sense of empowerment as their voices were being heard and their actions were benefiting their colleagues and students. Overall, data in this study indicated the importance of providing opportunities for teachers to become involved in meaningful leadership activities. It is important to note that there was no evidence that these teachers were interested in leadership activities that centered on administrative responsibilities.

During Phase 3 in their development of empowerment, the teachers in this study recognized the importance of lifelong learning and noted a strong need for collaboration with other professionals who were functioning at their level of competence. Some also sought new challenges. As already noted, their graphs showed a leveling off in their growth in empowerment. School districts should be flexible in allowing these Phase 3 teachers to forego some of the standard offerings and attend, instead, workshops and conferences that meet their individual interests and needs. They must be afforded opportunities to engage with colleagues in and outside their campuses. Fullan (1993) claimed that opportunities for teachers to work together as “kindred spirits” who were involved collegially would form a critical mass of empowered teachers with the capacity to renew schools on a continual basis. Of course, in doing so, they would be sustaining and renewing their sense of empowerment.

If teacher empowerment is to become a means of improving schools, then teachers must be supported throughout the process of reaching a self-actualized level of empowerment – of being all that they can be. Only a few of the teachers interviewed for this study had reached that level, and some of them were leaving the system due to lack of opportunities for further professional growth. The availability of such activities that are designed to increase their instructional capacity and provide opportunities for sustained collaborative interaction with other teachers would enhance the probability of their retention and that of other experienced and effective teachers who are at a similar stage in their careers.

Who better to ask what types of professional development opportunities have important impact on teachers than those teachers who have experienced them – teachers who have not only survived but thrived in their classrooms, schools, and the larger community. If we can identify pivotal events and gain some sense of when those events need to be made available to teachers, then we will have a chronology that will help us maximize the use of the quality professional development programs being identified and/or created via other research.

By better understanding the paths that successful teachers have followed (although in most cases probably unintentionally), we can infer some implications for professional development programs and policies for the future. This information should prove invaluable for those who plan professional developments, be they university professors, science specialists, or school administrators. In addition, the information, once disseminated, may help individual teachers better understand their own professional development needs and enable them to make wise choices accordingly.

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