



Received: 22 October 2015
Accepted: 24 March 2016
Published: 22 April 2016

*Corresponding author: Elly Govers,
Govers Educational Consultancy and
Research, 25 Birdwood Street, Taradale,
Napier 4112, New Zealand
E-mail: elly@goverseducation.co.nz

Reviewing editor:
Kris Gritter, Seattle Pacific University,
USA

Additional information is available at
the end of the article

CURRICULUM & TEACHING STUDIES | RESEARCH ARTICLE

Embracing the complexity of educational programmes

Elly Govers^{1*}

Abstract: Systems of monitoring and control have left many educators and organisations in the field of post-compulsory education struggling to find ways to meet the needs of an increasingly diverse society. Education is complex. Many educators would agree that it is influenced by many, often contradictory, voices and power structures. Based on the findings of a case study involving multiple programmes in a post-compulsory education institution in Aotearoa/New Zealand, this paper aims to unravel this complexity for the case of educational programmes. It describes how programmes can be seen as complex systems, created by people and directed by discourses in society, some of which are more influential than others. If programmes are seen as complex systems, the experience of struggle as referred to above can be understood as a consequence of the attempt to control the complexity rather than work with it. This control limits the possibilities for development and innovation. Alternatively, as this paper will explain, acknowledging and embracing the complexity of programmes helps open up spaces for innovation that would otherwise remain hidden. It is argued that the ultimate space for change is educators' personal and collective responsibility for the discourses in society they choose to follow.

Subjects: Curriculum; Curriculum Studies; Education Politics; Post-Compulsory Education

Keywords: curriculum; programme design; post-compulsory education; complexity

ABOUT THE AUTHOR

Elly Govers is a director, consultant and researcher at Govers Educational Consultancy and Research, Napier, New Zealand. She has many years of experience in advising post-compulsory education organisations on programme development and other educational matters. Her specific interest is curriculum in post-compulsory education in all its facets.



Elly Govers

PUBLIC INTEREST STATEMENT

The quality of post-compulsory education is often presented using simplified means such as predefined standards and league tables. These are controlled through systems requiring educational programmes to fit within prescribed frameworks and monitoring regimes.

Yet, post-compulsory educators are continuously expected to meet the needs of an increasingly diverse and complex society. However, the control systems are unable to cater for this complexity, and they also put limits on opportunities for development and innovation. Therefore, as an educator, it is easy to feel trapped.

This paper looks at educational programmes in a different way. It considers them as "living" entities that cannot be controlled, but are continuously influenced by the complexity of values and beliefs in society. When embracing this idea, this paper shows how new and empowering spaces for innovation of programmes open up that can help meet the widely diverse needs of society and students engaging in post-compulsory education.

1. Introduction

Educators and organisations working in the field of post-compulsory or higher education are continuously challenged to meet the needs of an increasingly diverse society. Yet, in Aotearoa/New Zealand, graduate outcomes of educational programmes are increasingly nationally prescribed and monitored; programmes have to fit predefined models and structures and are subject to rigorous approval and accreditation processes; learning outcomes are prescribed in minute detail; and moderation processes control assessments and sometimes also teaching methods and learning materials. Once a programme has been approved and is being taught, it is subject to educational performance indicators and accountability reports, and changes to the programme usually involve additional paperwork and approval processes.

As an educator working in this system, it is easy to feel trapped. The limitations put on attempts to innovate seem so overwhelming that it is tempting for educators and educational organisations either to not bother with making changes or to just tweak within the small space of autonomy that they have left.

Education is complex. Many educators would agree that it is influenced by many, often contradictory, voices and power structures. Based on the findings of a case study involving multiple programmes in a post-compulsory education institution in Aotearoa/New Zealand, this paper aims to unravel this complexity for the case of educational programmes.

If programmes are seen as complex systems, the feelings of being trapped as referred to above can be explained as a consequence of the attempt to control the complexity rather than work with it. As such, the control limits the possibilities for development and innovation. However, acknowledging and embracing the complexity of programmes can help identify spaces for change and innovation, and open up those spaces that would otherwise remain hidden.

The structure of this paper is as follows. Section 2 uses scholarly literature to explain the concept of complex systems as relevant to this paper. Subsequently, the research project that underpins the findings and the argument in this paper is described briefly in Section 3. Section 4 then presents how findings from this research project have created a picture of educational programmes as complex systems. Finally, in Section 5, spaces for change and innovation within these systems are identified and explained.

2. Complex systems

Complexity theory claims that phenomena can be understood as complex systems, which consist of innumerable constituents that connect, interact, organise and re-organise in countless ways (Mason, 2008). It has its origins in the natural sciences, among other things to understand ecosystems. There appears to be a growing body of literature applying this theory to help increase our understanding of education (e.g. Davis, Sumara, & Luce-Kapler, 2008; <https://ejournals.library.ualberta.ca/index.php/complicity/index>; Osberg & Biesta, 2010).

There is no single definition or conceptualisation of complexity or complexity theory (Aldaheff-Jones, 2008). A major distinction between different conceptualisations is whether or not a system is deterministic, i.e. whether the new possibilities that emerge from a complex system are foreseeable or not (Aldaheff-Jones, 2008; Osberg & Biesta, 2007). This depends on whether the complex system is closed or open. Determinism is related to closed systems, which do not interact with the outside world. Open systems, on the other hand, interact continuously with their environment, allowing adaptation and development in unpredictable ways (Osberg & Biesta, 2007). Because an open system's constituents are interconnected and the system interacts with the environment, such a complex system cannot be broken down in its parts, without losing some essential characteristics (Davis et al., 2008). This makes it difficult to create a picture of the whole of the system. The only way to get an indication of what the system looks like is to study patterns within the system that are identified in the moment (Smitherman, 2005).

The interactions between an open complex system's constituents and the environment create triggers and disturbances that shape subsequent interactions within the system, and cause the system to respond and change (Davis et al., 2008), thus creating new possibilities for the system as a whole. This process allows an open complex system to learn and develop without the help of an overseer (Davis et al., 2008; Mason, 2008). In other words, an open complex system is dynamic: it is not designed or developed, but it develops itself.

What holds a complex system together is its internal redundancy (Davis et al., 2008), i.e. the similarity in its constituents. This redundancy allows the constituents of the system to work together and give the system robustness and stability. The redundancy can be explained through the influence of power (Mason, 2008), as follows: as the system's continuous interaction with the environment creates new constituents, the system continues to adapt, but this adaptation is not random. Prevailing power structures in a complex system "lock-in" new constituents and steer them in a particular direction. Power in this sense can be defined as "the directional course of the phenomenon that enjoys the dominant inertial momentum over other competing phenomena" (Mason, 2008, p. 40). New constituents outside the dominant powers will not have any impact on a system's direction until the number of these constituents has reached a scale of sufficient complexity to allow the system to move in a different direction, i.e. to effect change.

A complex system needs redundancy for its cohesion and strength. However, too much redundancy leads to an unintelligent system that is unable to cope with situations of crisis (Davis et al., 2008), and ultimately such a system will die. For a complex system to survive and continue to develop in the long term, redundancy in the system needs to be balanced with diversity. Increasing the diversity leads to an exponential increase in possibilities which "enable novel actions in response to shifts in the grander context" (Davis et al., 2008, p. 196).

The above characteristics of complex systems can be identified in educational programmes. Section 3 describes the research project that led to this finding, and is followed by an explanation how the research data suggested considering programmes as complex systems.

3. Research methodology

The doctoral research project that underpins this paper concerned an interpretive case study by the author into understanding programme design practice at a polytechnic in Aotearoa/New Zealand. Polytechnics are post-compulsory education organisations which teach a wide range of vocationally oriented study programmes to people over the age of 15. The length of most programmes varies from 12 weeks to 3 years. Programmes range from foundation to undergraduate degree and sometimes postgraduate studies.

The research project sought to attain an understanding of programme design through investigating the meanings embedded in practitioners' own social constructions of their design practices (Baker & Johnson, 1998; Burr, 2003; Schwandt, 2000). Programmes in this regard are defined as a sequence of courses (a.k.a. units, modules, papers or subjects) that lead to a qualification. Only programmes leading to sub-degree qualifications were included in this study.

To study programme design from an institution-wide perspective, eight senior managers and academic leaders in the institution were interviewed. In addition, the institution's Academic Statute and Quality Management System documents were analysed as they provide institution-wide direction on programme design. Furthermore, five existing programmes across the institution were selected and relevant people involved in design practice of these programmes were interviewed. Across these programmes, these people included eight managers, nine teachers, four programme-coordinators/teachers, two representatives from industry standard-setting bodies and one programme design advisor. For one programme, the programme document was analysed plus a programme approval meeting was observed.

The interviews were semi-structured. Participants were asked what they found important when making programme decisions, and why. Decision-makers at the institutional level and in one programme were interviewed about design at both programme and course levels. From these interviews, plus the document analysis and the observation notes, initial findings were developed. The remaining four programmes were only studied at either course or programme level. They were used to either amend or confirm the initial findings, thus allowing some analytical generalisation (Yin, 2003).

Informed consent was gained for the interviews and the use of the documents. Interviews were audio-recorded, transcribed and edited. The latter involved summarising the transcripts by identifying the substantive elements that would contribute to meaning-making, in the participants' own words, so the summaries would continue to validly reflect the actual interviews (Gillham, 2005). The edited transcripts were approved by participants before they were used for analysis.

For the data analysis, the stance was taken that people's perspectives as presented in interviews and documents are not only shaped by their worlds, but they also shape the world, as people "talk" their perspectives "into being" (Heritage, 1997, p. 161) when interacting with others, and in doing so, they influence the perspectives of others (Bloome & Clark, 2006; Holstein & Gubrium, 2008).

This implies that the research data are not just the participant's straight answers to the interview questions, but also, and more importantly, her/his meanings that account for these answers in the context of her/his world. To unravel these meanings, it was important to take into account how the participant provided the information—e.g. what language s/he uses or what s/he does not say—in addition to what information s/he provides (Baker & Johnson, 1998; Holstein & Gubrium, 2008). Holstein and Gubrium (2008) explain this approach as a concern with both "discursive practice"—i.e. what people say or write in documents— and "discourses-in-action"— i.e. how they say or write this. They refer to Foucault's definition of discourse as "practices that systematically form the objects of which they speak" (Foucault, 1972, p. 54), a definition that highlights the interaction between what is spoken and how it is spoken, and which was adopted for this study. By analysing the interplay between discursive practices and discourses-in-action, as Holstein and Gubrium (2008) suggest, it was possible to unravel which discourses were brought into practice as people constructed their programme design practice perspectives.

Following this approach, the analysis of the transcripts, documents and observation notes then concentrated on two questions: (1) What do decision-makers find important when making programme decisions? (2) Why do they find this important? Extracts from the data were identified that indicated answers to one or both of these questions, in the form of either what was said or written, or how it was said or written. The identified extracts are referred to as "considerations" in this paper. Subsequently, NVivo® was used to help cluster related considerations into themes.

The next steps consisted of explaining the themes and their interrelationships in order to identify the political, educational and societal discourses that were in action within the data, and gain the deep understanding of programme design that was sought in this project.

Section 4 explains how the research data suggested explaining programmes as complex systems. It also describes how the discourses that appeared to be "in action" in the data can be seen as the powers that steer programmes as complex systems.

4. A programme as a complex system

The research data provided a myriad of considerations regarding what people find important in making programme decisions and why they find this important, and there were obviously many more considerations that remained hidden during the research process. The full set of these spoken and unspoken considerations can be seen as making up programmes as complex systems, in the following way.

There were three types of considerations in the data, which are summarised in Figure 1 and explained below.

- (1) The first type of considerations identified which aspects of education are seen as belonging to programmes and which are not. These considerations distinguish programme design practice from the wider practice of education in general and as such create a boundary around what is to be considered part of a programme as a complex system and what is part of the “outside world”. For example, “how to assess” was identified as a programme consideration, but “introducing a smoking ban on campus” was not. Such a boundary gives a programme a stable identity, i.e. it ensures that people have a common notion about the concept of a programme. Across the data, it was found that a programme was bounded by considerations in the following six categories: (1) programme intentions, including purposes, goals and objectives; (2) programme structure and teaching methods; (3) administration, resourcing and management; (4) student assessment; (5) programme evaluation; and (6) consultation and development processes. In each category, multiple sub-categories of more detailed decision-making topics were found.
 - (2) The second type of considerations expressed who is considered to have roles and responsibilities in programme decision-making. This type also creates a boundary around the concept of a programme in the sense that it captures whose voice is included in the programme and whose is not. It was found that it is not a single person who has a voice, but a complex construct of people across the institution, particularly including managers at all levels, teachers, academic and student support people, and the Academic Board, which is the cross-institutional committee overseeing the assurance of academic quality. Programme documents were also found to be an important part of this construct. Hardly any evidence was found that students or people outside the institution were assumed to have a role in programme design matters.
 - (3) The third and final type of considerations was formed by the constituents that collaboratively make up a programme as a complex system: the actual programme deliberations and the rationale for these. These considerations were found in the data in six different forms, as summarised in Figure 2. They are explained below. Each form is illustrated with a quote as a typical example from the data.
- *Words and expressions* that people use to articulate programme considerations and decisions. For example, “[...] we would be looking at producing work-ready graduates out of the certificates and diplomas” (Institutional decision-maker). This example expresses the purpose of certificate and diploma programmes. The words that are used simultaneously create a picture of a programme as a production process, the product of which are work-ready graduates.

Figure 1. Three types of considerations as identified from the data.

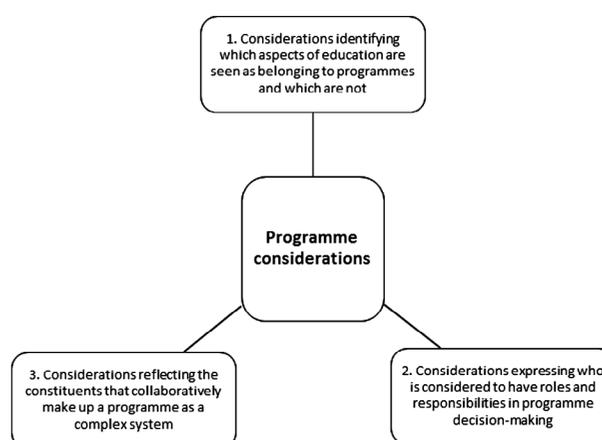
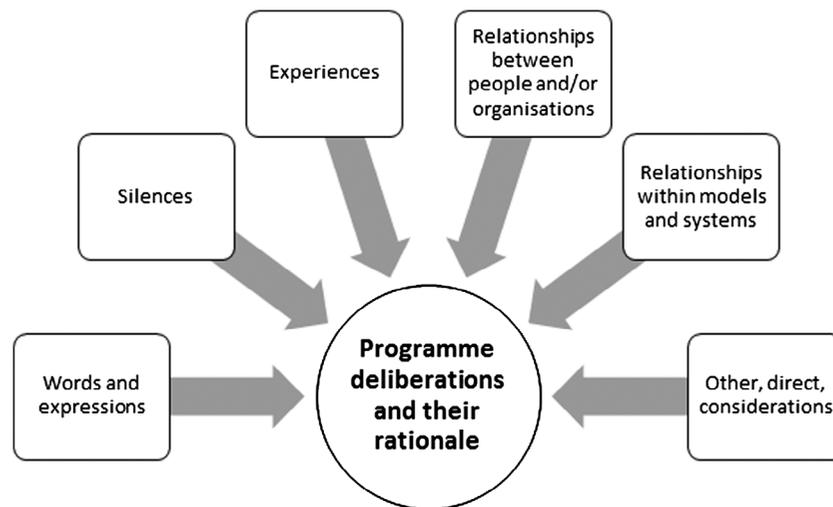


Figure 2. Six different forms of programme deliberations and their rationale that collaboratively make up the constituents of a programme as a complex system.



- *Silences* that remain unspoken or unwritten, but can be deduced from what is spoken or written and from how this is spoken or written. For example, “Summative assessments may be conducted in Te Reo Māori. Conditions and requirements may apply and these are documented in the [Quality Management System] or programme regulations”. The silence in this clause from the institution’s Academic Statute is that all assessments are normally conducted in English.
- *Experiences* that reflect personal life experiences from inside or outside the programme or the institution which people consider in making programme decisions. For example, “Something that influenced me strongly was the attitude of our own daughter, and our son, and I learned quite a lot from them about what young people’s needs are” (Institutional decision-maker). This personal experience contributed to decisions on student needs and how these needs can be met in the programme.
- *Relationships between people and/or organisations* that are found in people’s expressions of professional, moral and political responsibilities to others, and in their assumed and assigned roles and responsibilities in relation to programmes. An example is the following consideration of political responsibility to the government: “It is important that [the students] can achieve the course because the ministry require [sic] course completions and they monitor our completions and that will get more so” (Manager).
- *Relationships within models and systems* that express how internal relationships of components within a model or system are used to inform decision-making. An example is the following illustration of using relationships between course levels on the New Zealand Qualifications Framework (NZQA, n.d.) to help define the sequence of courses in a programme: “I’d be hoping that [programme developers] are picking [courses] like level 1 before level 2 before level 3 for example, but it does not always work that way” (Institutional decision-maker).
- *Other, more direct, considerations, which are not included in the above forms.* For example, the following is a direct consideration about resourcing of a programme: “If we are a business unit, which I guess we are, we need to think business-wise, which is technology and infrastructure change and we need to change with it” (Teacher).

Summarising, the constituents of a programme as a complex system can be seen as countless considerations, words and expressions, silences, experiences and relationships that are contributed by the people involved. The system is bounded by the inclusion of selected aspects of education only and of the voices of a particular group of people only.

The programme’s constituents connect, interact, organise and re-organise within people’s own thought processes, and through the interaction of the people involved. The organisation of the constituents appeared most obvious in the groups of similar constituents found across participants and

documents and identified as themes in the data. For example, one theme consisted of similar words and expressions that collaboratively pictured a programme as a production process, the purpose of which is to produce graduates for the workforce. Another theme consisted of similar considerations regarding student entry into programmes, which indicated that everyone should be able to enrol in a programme, and that the institution should carry the consequences of the student's enrolment and provide services to support students during their studies. Each theme demonstrates the redundancy that is needed to allow the constituents of a complex programme system to work together and provide stability to the system. In all, 71 themes were identified from the data.

A complex programme system is open because of the involvement of people. It is people who contribute the constituents to the system, and their lives consist of more than just being involved with programmes: they interact with other people and with the world outside a programme through their everyday lives. They bring experiences from these interactions into the programme, and these experiences in their turn interact with the existing constituents of the system. An example of such an experience is the following:

All of our [teachers] come from private schools 'cause that's all that was available so we know what the training was like. We've tried to replicate that, plus more, because we're a longer programme. We've worked really hard at making sure we ensure those higher standards. (Programme Coordinator)

This interaction between the multiple people involved and the "outside world" is continuous. It ensures that new constituents are continuously brought into the system. This implies that a programme has no "overseer", i.e. there are no people who could be identified as having full control over the design of a programme. More than that, there is no such thing as "the design of a programme". A programme is developing continuously, from the moment of its inception until it dies. This idea challenges the notion of distinct programme design and implementation stages, which has become accepted in Aotearoa/New Zealand post-compulsory education under the influence of national education policies introduced in the early 1990s (Govers, 2010). Instead, at any moment in time, a programme "is". It has become what it is now as a result of the interactions of the constituents and it is "ever changing, ever stable, ever alive" (Doll, 2005, p. 55). A programme can therefore only be studied in the moment and from a certain perspective, which was referred to earlier as studying "patterns in the moment" (Smitherman, 2005). In this research project, the identified considerations were generated at particular points in time and with particular people. If the same programmes were studied now and even with the same people, the findings would create a changed picture of the complex programme system.

It was noted earlier that 71 themes emerged from the data, which were explained as demonstrating the redundancy in the system. This redundancy went even further in that the themes appeared to be interconnected through discourses in society that were found to be "in-action" in the data. The themes were shaped by those discourses, and simultaneously, by being shaped, they also strengthened the influence of the discourses within the system. In this way, discourses in society act as power structures that steer complex programme systems in particular directions.

An example is the following. Market discourses have influenced education in Aotearoa/New Zealand since 1989 (Olssen, Codd, & O'Neill, 2004). In this research project, market discourses appeared to shape various themes in the data. Words which express programmes as a product manufactured by an institution and sold to students-as-customers created a theme that pictured a programme as a consumable product. The purpose of such a programme is to sell as many products as possible, and to do so, it is important that customers are satisfied. This perceived importance of customer satisfaction was also reflected in other themes, such as: the importance to meet customer needs; student support should involve meeting their needs and wants; and students should have a voice because they are paying customers. Additionally, a theme named "market considerations"

expressed the concern about how the institution could grow or at least retain its share of the student market.

Market discourses were chosen here as an example because they belong to a consistent range of discourses which “regard the community as founded upon economic relations” (Ball, 2006, p. 39), and can be summarised as neoliberal. They include, but are not limited to, human capital theory, agency theory, new public management, contractualism, managerialism, public choice theory, utilitarianism and above-mentioned market discourses (e.g. Boston, Martin, Pallot, & Walsh, 1996; Codd, 2005; Harris, 2007; Olssen et al., 2004). Neoliberal discourses appeared to be the dominant influence in the findings. Of the 71 themes identified from the data, 40 could be explained as having been shaped by neoliberal discourses. Twelve themes could be understood through humanist, social change or communitarian discourses, while another 12 themes had the potential to shape alternative directions for the system, but they did not seem to have had sufficient power to do so, and were “gathered up in the path” of neoliberalism (Mason, 2008, p. 40). An example of the latter was found in themes that indicated decision-makers’ sense of responsibility to students. On the one hand, neoliberal discourses shaped themes that reflected responsibility to students in the role of customers, i.e. as people who (potentially) purchase the programme as a product. On the other, alternative discourses shaped themes which also explained a responsibility to students, but as fellow human beings who are seeking support in their development. The dominance of neoliberal discourses ensured that themes which expressed a responsibility to students-as-customers outnumbered the alternative perspectives. The dominance also silenced the alternatives through the adoption of multi-explanatory language, i.e. words or expressions that can have many and potentially widely differing meanings, but with which no one will disagree. After all, how many educators would disagree with the expectation that they have a responsibility to students? The adoption of multi-explanatory language and subsequent lack of debate about its meaning allow the dominant discourse to prevail. These findings resonate with Olssen’s observations on the development of lifelong learning discourses, showing “how educational and economic practices mutually condition and adapt to each other” (Olssen, 2006, p. 213).

Finally, seven themes did not seem to have been shaped by discourses in society. Six of those consisted of the personal experiences of the people involved, and formed examples of how the programme system interacted with people-as-systems. The seventh non-discourse-related theme demonstrated decision-makers’ concern for the survival of the programme and the institution, possibly because survival of the programme supports people’s own survival in earning a living. Likewise, survival of a programme seemed paramount in helping keep the institution alive. The latter strengthens the idea of a programme as an open complex, “living”, system, which needs to interact with its environment for its own survival, and by doing so, it not only helps shape the environment but also supports the survival of the environment (Stacey, Griffin, & Shaw, 2000), that is, in this case, the survival of the people and the institution.

5. Identifying spaces for innovation and change

At first sight, acknowledging an educational programme as a complex system can be so overwhelming compared to working with models in which the complexity is reduced and controlled that it seems to make the task of innovation and change even more daunting. However, if complexity is acknowledged, it provides insight into and opens up spaces for change which remain otherwise hidden. The idea of “spaces” aligns here with that of “enabling constraints”, which allow complex systems to “maintain a delicate balance between sufficient structure, to limit a pool of virtually limitless possibilities, and sufficient openness, to allow for flexible and varied responses” (Davis et al., 2008, p. 193).

Firstly, considering a programme as a complex system acknowledges that a programme is necessarily inclusive of the perspectives of all people involved. It helps see the programme through the eyes of others and therefore value others as important and indispensable contributors to the programme system. This insight provides a language and opens up a space for empowering dialogue

about the range of contributing perspectives, and how they will create possibilities for new directions to emerge in the system.

Secondly, embracing complexity helps understand that programmes not only need redundancy but also diversity. Diversity increases the number of possibilities in the system and allows the emergence of alternatives needed by a programme in order to cope with crises. This helps ensure the programme's survival and development in the long term. New ideas enter a programme system via people's experiences and relationship with the environment. Therefore, increasing diversity in the system means diversifying people's experiences and their relationships with the environment. From the complex programme system described in this paper, the following possible ways to realise this arise:

- Enriching the experiences and professional relationships of all people involved through professional development. To increase diversity, this professional development needs to reach beyond reinforcement of the dominant—in this case, neoliberal—discourses;
- Increasing the number of people involved. This will increase the number of experiences and relationships, and therefore the number of possibilities, but only if the new people do not bring more of the same, as this would only increase redundancy. For example, in a team of teachers who all have an industry background, this might mean bringing in new people with experience in secondary school teaching, or people who identify with other ethnicities, have a different first language, have different abilities, are of a different age or gender, have different personal life experiences, etc;
- Involving students as programme decision-makers. This means development of programmes *with* instead of *for* students, using students' experiences and relationships with the world to dramatically increase the possibilities for the system's development. In addition to diversification, this would also enable a programme to steer away from "planned enculturation", which is promoted through outcomes-focused discourses, towards an emergent curriculum (Osberg & Biesta, 2008), where students can "explore the social and economic milieu and to construct personally meaningful understandings of the world and their place in it" (Ayers & Carlone, 2007, p. 477).

However, just diversifying the experiences and/or relationships in these three ways does not necessarily diversify the system (Arnold, 1993). The new experiences and relationships must be integrated in the programme system and the people who contribute them need to be acknowledged as equal contributors. Only then are the new experiences and relationships able to connect with all other constituents of the system allowing new possibilities to emerge (Davis et al., 2008). Secondly, the new experiences and relationships must be of sufficient scale and complexity for alternative directions to emerge (Mason, 2008). It is therefore important that professional development, bringing in new people and involving students as programme decision-makers occur across all aspects of a programme and at all levels of programme decision-making within an organisation.

A space for educators to realise this diversification can be found in the autonomy of the people involved with the programme. In the research project, the relationships between the people involved appeared to be structured in alignment with agency theory (Boston et al., 1996): the government as principal has a "contract" or agreed relationship with the institution as agents, and subsequently the institution as principal has "contracts" or agreed relationships with departments and teachers as agents. It was however found that none of the constraints set by these "contracts" dictated who should be involved with a programme. The complex programme system had used the space that autonomy within the constraints provided to construct the group of people involved and define their roles and responsibilities. This implies that this same autonomy offers space to integrate new and diverse experiences and relationships into the system, by revising the group of people involved and redefining their roles and responsibilities.

Other spaces to diversify the system are found in multi-explanatory themes or concepts. For example, “we have a responsibility to students” and “assessments should be fair” have different meanings within different discourses. In the research project, the meanings of such themes were dominated by neoliberal discourses, but their mere existence and acceptance within the system create space for dialogue about their various meanings. For example, in programme discussions, educators could ask: “You talk about assessments having to be fair; what does the word ‘fair’ mean to you?” The resulting discussion can act as a positive feedback loop (Davis et al., 2008) to strengthen alternative discourses. Other seeds of alternative discourses already found in the system can also be supported to blossom in this way, for example, by initiating and continuing conversations about the meanings of learning, knowledge and teaching.

Considering programmes as open complex systems implies giving up the illusion of predictability and control and accepting that the development of a programme is controlled by the dynamics of the system, and not by individuals or institutions. This implies that the outcomes of a programme system cannot be predicted. As a consequence, the outcomes of any two programmes taught at different institutions are not predictable and almost certainly differ, even if those programmes use the same programme documents, course materials and assessments. Education decision-makers who promote, e.g. collaborative development of programmes, often for purposes of resource efficiency, ignore the dynamics of programme systems not shown in the documents, including the ongoing adaptation of the system after the programme documents have been completed. For example, educators reflect on their experiences in the programme and bring their reflections back into the system in the following year; or new teachers’ previous experiences or teachers’ interactions with new groups of students will change the courses they teach. As a consequence of these interactions, new possibilities continue to emerge, the programme continues to adapt and the outcomes of the programme continue to change.

It is important to note, however, that this does not imply that the outcomes of a programme cannot be influenced. The research project has shown how discourses in society influence the direction of the programme. This influence can even create an illusion of predictability, as the following illustrates. Measurement of programme outcomes tends to occur through assessment, which measures the outcomes of student learning, and/or evaluation, which measures the effectiveness and efficiency of the programme. Constituents concerning assessment and evaluation are however integral to a complex programme system. This means that they shape and are shaped by the same discourses that direct the system as a whole. Therefore, they can act as a self-fulfilling prophecy, creating an illusion of predictability and controllability of the outcomes they are measuring.

Thus, the unpredictability of outcomes implies that educators must accept that the impact of their contributions to a programme is unavoidably uncertain, but that they do have the power to influence the direction of the system. This implies that the direction of influence—i.e. the discourses that shape the educational process—becomes more important than the focus on outcomes. Instead of being narrowed down by prescribed outcomes and frenetic efforts to monitor and control these outcomes, programmes require no more than decisions on the directions of influence. To do so, it is important to be continuously reminded that a programme is an instrument for education. Education “directs the kind of learning that takes place”; it “purposely shapes the subjectivity of those being educated” (Osberg & Biesta, 2008, p. 314). Hence, deciding on the “right” direction of influence is an enormous responsibility for educators and education organisations.

Unfortunately, complexity theory is unable to provide guidance in this matter. Complexity theory does not concern itself with what ought to be, and therefore ethics and values are inherently absent in complexity theory (Fenwick, 2009; Morrison, 2008). Instead, ethics and values are located in the discourses that steer the direction of a complex programme system. In the research project, neoliberal discourses appeared dominant, but that would not necessarily be the case for programme systems in other contexts.

So where does this leave responsibility? Considering a programme as a complex system does not imply that certain discourses are right and others are wrong. However, it does imply that a too narrow development in the direction of one particular type of discourse—in this project they were neo-liberal discourses—endangers the survival of a programme. This paper has explored spaces that allow influencing away from the dominant discourses to increase the possibilities for a programme's survival and continued development. To do this, diversification is needed to help shape programmes that are inclusive of others and of alternative ways of thinking. But this does not take away the responsibility of the people involved. As educators, we are subject to the discourses in our society, and we have a choice to either follow or resist them. If we refrain from making this choice, we will be absorbed into and continue to reinforce the mainstream discourses. This leaves us with the ultimate space for change: our personal and collective responsibilities to debate and decide which discourses to follow. This means that we have a responsibility to think critically about the discourses we choose to follow and to be mindful of the possible consequences of our considerations, experiences, relationships and of the words, expressions, models and systems we use, so we can un-silence the silences and contribute to the sustained development of our programmes and of education for all people.

Acknowledgement

The author wishes to thank Lani Morris for her thoughtful feedback during the creation of this paper.

Funding

The author received no direct funding for this research.

Author details

Elly Govers¹

E-mail: elly@goverseducation.co.nz

¹ Govers Educational Consultancy and Research, 25 Birdwood Street, Taradale, Napier 4112, New Zealand.

Citation information

Cite this article as: Embracing the complexity of educational programmes, Elly Govers, *Cogent Education* (2016), 3: 1172395.

References

- Aldaheff-Jones, M. (2008). Three generations of complexity theories: Nuances and ambiguities. *Educational Philosophy and Theory*, 40, 66–82. doi:10.1111/j.1469-5812.2007.00411.x
- Arnold, G. B. (1993). *Institutional constraints on the development of curricular policy alternatives*. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, Pittsburgh, PA. Retrieved from ERIC database.
- Ayers, D. F., & Carlone, D. (2007). Manifestations of neoliberal discourses within a local job-training program. *International Journal of Lifelong Education*, 26, 461–479. doi:10.1080/02601370701417277
- Baker, C. D., & Johnson, G. (1998). Interview talk as professional practice. *Language and Education*, 12, 229–242. doi:10.1080/09500789808666751
- Ball, S. J. (2006). *Education policy and social class: The selected works of Stephen J. Ball*. Abingdon: Routledge.
- Bloome, D., & Clark, C. (2006). Discourse-in-use. In J. L. Green, G. Camilli, & P. B. Elmore (Eds.), *Handbook of complementary methods in education research* (pp. 227–241). Washington, DC: American Educational Research Association.
- Boston, J., Martin, J., Pallot, J., & Walsh, P. (1996). *Public management: The New Zealand model*. Auckland: Oxford University Press.
- Burr, V. (2003). *Social constructionism* (2nd ed.). Hove: Routledge.
- Codd, J. (2005). Education policy and the challenges of globalisation. In J. Codd & K. Sullivan (Eds.), *Education policy directions in Aotearoa New Zealand* (pp. 3–17). Southbank: Thomson/Dunmore Press.
- Davis, B., Sumara, D., & Luce-Kapler, R. (2008). *Engaging minds: Changing teaching in complex times* (2nd ed.). New York, NY: Routledge.
- Doll, W. E. (2005). The culture of method. In W. E. Doll, M. J. Fleener, D. Trueit, & J. S. Julien (Eds.), *Chaos, complexity, curriculum, and culture: A conversation* (pp. 21–75). New York, NY: Peter Lang.
- Fenwick, T. (2009). Responsibility, complexity science and education: Dilemmas and uncertain responses. *Studies of Philosophy in Education*, 28, 101–118. doi:10.1007/s11217-008-9099-x
- Foucault, M. (1972). *The archaeology of knowledge*. London: Routledge.
- Gillham, B. (2005). *Research interviewing: The range of techniques*. Maidenhead: Open University Press.
- Govers, E. (2010). On the impact of government policy on programme design in New Zealand post-compulsory education. *Research in Post-Compulsory Education*, 15, 141–158. doi:10.1080/13596741003790666
- Harris, S. (2007). *The governance of education: How neo-liberalism is transforming policy and practice*. London: Continuum.
- Heritage, J. (1997). Conversation analysis and institutional talk: Analysing data. In D. Silverman (Ed.), *Qualitative research: Theory, method and practice* (pp. 161–182). London: Sage.
- Holstein, J. A., & Gubrium, J. F. (2008). Interpretive practice and social action. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry* (3rd ed., pp. 173–202). Thousand Oaks, CA: Sage.
- Mason, M. (2008). What is complexity theory and what are its implications for educational change? *Educational Philosophy and Theory*, 40, 35–49. doi:10.1111/j.1469-5812.2007.00413.x
- Morrison, K. (2008). Educational philosophy and the challenge of complexity theory. *Educational Philosophy and Theory*, 40, 19–34. doi:10.1111/j.1469-5812.2007.00394.x
- NZQA. (n.d.). *Understanding New Zealand qualifications*. Retrieved March 15, 2013, from <http://www.nzqa.govt.nz/studying-in-new-zealand/nzqf/understand-nz-quals/>
- Olssen, M. (2006). Understanding the mechanisms of neoliberal control: Lifelong learning, flexibility and knowledge capitalism. *International Journal of Lifelong Education*, 25, 213–230. doi:10.1080/02601370600697045

- Olszen, M., Codd, J., & O'Neill, A.-M. (2004). *Education policy: Globalization, citizenship & democracy*. London: Sage.
- Osberg, D., & Biesta, G. (2007). Beyond presence: Epistemological and pedagogical implications of strong emergence. *Interchange*, 38, 31–51. doi:10.1007/s10780-007-9014-3
- Osberg, D., & Biesta, G. (2008). The emergent curriculum: Navigating a complex course between unguided learning and planned enculturation. *Journal of Curriculum Studies*, 40, 313–328. doi:10.1080/00220270701610746
- Osberg, D., & Biesta, G. (Eds.). (2010). *Complexity theory and the politics of education*. Rotterdam, NL: Sense.
- Schwandt, T. A. (2000). Three epistemological stances for qualitative inquiry: Interpretivism, hermeneutics, and social constructionism. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 189–213). Thousand Oaks, CA: Sage.
- Smitherman, S. (2005). Chaos and complexity theories: Wholes and holes in curriculum. In W. E. Doll, M. J. Fleener, D. Trueit, & J. S. Julien (Eds.), *Chaos, complexity, curriculum, and culture: A conversation* (pp. 153–180). New York, NY: Peter Lang.
- Stacey, R. D., Griffin, D., & Shaw, P. (2000). *Complexity and management: Fad or radical challenge to systems thinking?* [Ebrary Reader version]. Retrieved from Ebrary database.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage.



© 2016 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

You are free to:

Share — copy and redistribute the material in any medium or format
Adapt — remix, transform, and build upon the material for any purpose, even commercially.
The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made.
You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
No additional restrictions

You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



Cogent Education (ISSN: 2331-186X) is published by Cogent OA, part of Taylor & Francis Group.

Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com

