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## **Understanding Curriculum: An Actor Network Theory Approach**

Michael Carroll, Momoyama Gakuin University, Japan.

### Abstract

This paper, attempts to use Actor Network Theory to describe a university curriculum as a process in which human ‘actors’ (teachers, learners, administrators and others) interact with each other and with aspects of their environment considered to have agentive roles similar to those of the human participants (books, computers, desks, classrooms, physical spaces, online spaces and so on), to form the networks which embody curricula and curriculum change. As teachers or learners taking part in any curriculum process, the knowledge we enact, the identities we take on, and the behaviours we engage in are all influenced by these networks. Put simply, this kind of approach is an attempt to understand why specific curriculum changes are successful or unsuccessful, and how we can go about initiating the process of change in rational and sensitive ways.

*Keywords:* curriculum, Actor Network Theory, autonomy

This paper is an attempt to explore whether Actor Network Theory might have some usefulness in describing what happens when curriculum changes occur in institutions, in particular, questions concerning why some curriculum change processes so often yield relatively little in terms of improved learning outcomes. It poses the question, ‘What is it that we do not understand about how educational organisations work and how they change?’

Curriculum studies in language teaching, and in TESOL in particular, have frequently taken a mechanistic, top-down view of how changes are initiated and how in fact they are put into practice. In teacher lounges it is a common gripe that changes have been implemented with little or no consultation, and often with little understanding of the reality of the classroom. There is frequently a gap between the intended outcomes of curriculum initiatives, and the results as perceived by teachers, students and other players (Hashimoto, 2009, Kaplan et al, 2011, Ng, 2016).

The paper will first review the literature around curriculum studies in TESOL, looking in particular at how the term *curriculum is used*; it will then outline the basic ideas behind ANT, and will argue that there is a case to be made for the usefulness of ANT in exploring curriculum change. Finally an ANT case study will be discussed.

### **What is curriculum?**

The word *curriculum* is typically used in lay terms as if it were a physical entity. Typically it is described as something created by a small group of experts, and then distributed to a larger

group of users: teachers, administrators, funding bodies, students. Marsh (1997) discusses some of the terminology, as found in a various institutional contexts. They include formulations such as, *sets of subjects or materials, performance objectives, learner experiences*, and “*what is taught, both inside and outside the school, and directed by the school*” (page 3). These formulations often envisage curriculum as simply a set of documents listing content items and outcomes for a particular program. These usages all fit within what Grundy (1987) calls *curriculum as product*. However these sorts of documents are only a small part of what curriculum theorists mean when they talk of 'curriculum'. Grundy focusses on learners' experiences, but also introduces the notion of curriculum as a social artefact, brought into being by both teachers and learners through their practice. She claims that for a curriculum to be effective in any meaningful way it needs to be “coherent, ... conscious .. and consensual” and that “within the shared professional community of the school there needs to be a shared culture which supports the construction of a worthwhile curriculum.”(Grundy, 1994, p. 12) This definition recalls the earlier work of Lawrence Stenhouse, who saw curriculum as a set of understandings shared by teachers (Stenhouse, 1977), and David Tripp, who viewed curriculum as “a systematic set of relations between particular people, objects, events, and circumstances” (1987 p. 7).

The idea of curriculum as a social network is a perspective that many teachers intuitively understand, though they may not usually think of curriculum in these terms. Such perspectives are, in practice, rarely acknowledged when a curriculum is being designed, but Grundy, Marsh, Tripp and Stenhouse all situate the curriculum to a large part in the consciousness of those who participate in educational activity: teachers, learners and other actors. This view of curriculum as a process is essential in thinking about institutional changes, how they come about, and how they work their way through the systems to which they are applied. Despite the lay perception that all that is necessary to change a curriculum is to draw up a plan and give out instructions, in fact, if curriculum is viewed as a complex social system, then we need to go beyond this kind of simplistic model. Grundy's (1984) view of curriculum as praxis, positioning students and teachers as simultaneously both co-creators of the curriculum and co-learners, and Tripp's view, incorporating physical entities as well as social ones, do just this. These ways of thinking about curriculum as a social phenomenon, and as one influenced by the physical objects which make up the educational environment, bears a strong resemblance to the ideas behind Actor Network Theory.

Actor Network Theory (ANT) offers a more comprehensive way of understanding complex social processes, including curriculum changes, compared with traditional analyses. Harris and Marsh (2005) and Bigum and Harris (2004) make the case for investigating the social phenomena of curriculum processes without forcing such investigation into a pre-determined frame, and builds

on the idea of curriculum as a process with the claim that it can be understood in terms of networks comprising both humans and physical objects: classrooms, computers, documents and so on (Latour, 2005, Law, 2007). By not allocating preconceived roles to participants, and by acknowledging the impact of physical aspects of the environment on social actions, they argue that ANT is an appropriate way to investigate the complexities and richness of social processes.

### **Actor Network Theory**

Actor Network Theory (ANT) has its origins in the field of Science and Technology Studies, as pioneered by Bruno Latour, together with John Law and Michael Callon in the late 1970s and 1980s, and it has some considerable similarities with the ethnomethodology of Howard Garfinkel (Latour and Woolgar, 1979; Callon, 1986; Law, 1986; Garfinkel 1967). Science and Technology Studies, sometimes known as STS, or as the sociology of science, is primarily concerned with how knowledge is socially constructed, how scientists interact with each other and with their working environments, and how these interactions result in some ideas becoming accepted as “science”. However, a defining aspect of ANT is that it treats human and non-human *actants* (entities with the *potential* to influence a social network) as equivalent, and acknowledges that they have equal potential agency (influence) over other entities within their networks. (In ANT terminology *actants* become *actors* when they realise this potential, and do in fact begin to influence other parts of the network.)

Latour (2005), outlining the aims and objectives of ANT, claims that traditional social science has reached a dead-end and is increasingly unable to produce useful knowledge. He contends that this is because our understanding of the word *social*, as well as the word *science* has changed drastically. In particular *society* has come to be thought of more and more as a fixed entity with known and set categories, no longer to be investigated in its own right, but only as one *domain of reality*, one factor that helps to explain other domains - biological, linguistic, natural and so on. But in fact this reification of *society* as a social context in which other activities take place, a taken-for-granted, unexamined “black box”, hides the dynamic nature of human (and non-human) association. The purpose of the *network* in actor network theory is to get away from this reification of *society*, and to see it not as something with stable and fixed characteristics, but as “visible only by the traces it leaves [...] when a new association is being produced between elements which are in themselves in no way social.” (Latour, 2005, p. 8)

An ANT approach to curriculum change, therefore, does not begin with pre-determined categories, slotting people and objects (actants/actors) into already known roles, but starts from a

position more akin to that of an anthropologist studying some previously unknown community, seeking to discover through observation what categories and roles might be significant. In this it has similarities with grounded data collection methodologies. The network to be studied therefore includes a wide range of people who have some involvement in a particular course or program, as well as the infrastructure through which the program is realised. This includes teachers and learners of course, but also those in administrative roles (using *roles* here in the sense of formal positions in the organisation); those who, for instance, co-ordinate teaching responsibilities, materials, testing and so on; those who maintain computer and audio-visual hardware; those who allocate classroom space and timetables; those who market programs outside the institution and so on. The institutional connections between these actors (for instance as might be shown in an organisation chart), constitute one facet of the network, but not the only one. There will very likely be many other "traces ... between elements" (Latour, 2005, p. 8). Personal relationships between two teachers who share materials might leave one trace, while personal animosity between two others might leave another. Learner's excitement at using computers, or dislike of drama techniques, or discomfort under poorly managed air-conditioning might leave others. Furthermore, beyond all these human traces will be those left by the physical environment itself: the classrooms, blackboards, computer facilities, canteens and vending machines, photocopiers and so on. (For instance the presence of an electronic whiteboard, as opposed to a traditional blackboard will influence the ways teachers and students interact by facilitating certain behaviours, and inhibiting others.). Actor Network Theory, describing the way in which these traces inter-relate, thus goes beyond Tripp's definition of curriculum as being a set of *systematic* relations. Instead it characterises all networks, curriculum-related ones included, as 'a group of *unspecified* relationships among entities of which the nature itself is *undetermined*' (Callon, 1993, p. 263). In other words, while some curriculum relationships are certainly systematic, there are also those that are not. Situations develop in ways that are not predictable, and relationships, actions, and results emerge from the interactions between entities. There is some similarity, especially in regard to this notion of *emergence*, with the recent work on complex dynamic systems in second language acquisition (Larsen-Freeman, 2012, Ellis, 2007, Ellis and Larsen-Freeman, 2006).

Actor Network Theory therefore conceives of the social and physical environment surrounding the operation of a curriculum as a network, the nodes of which are actants (entities, both human and non-human with the potential to influence other entities). This network is complex and messy. When we first approach it to try to understand what is going on we may see only an undifferentiated mass of network nodes, but as we look deeper, and as time passes, we will be able

to discern changes in the ways these nodes move in relation to each other and form recognisable patterns, as individual actants take up ideas and become actors for or against change.

A further complicating factor, however, lies in what ANT theorists call *black boxes*. A black box is a group of entities that together form a network within a network, and that operate together so smoothly that they appear to be a single entity, and are accepted as such by other entities. A textbook may be a black box, in that it is easy to think of it as a single component of a curriculum, but in fact it is composed of many different parts, may be written by different people, and may reflect a variety of assumptions, which may or may not be explicit. Ideas, too, may be black boxes: for example the idea that learning a language requires grammar study to come before practice may be entirely uncontroversial for some, but a prime site for examination and deconstruction for others. The problem of black boxes, for ANT, is that they are usually, by definition, unopened, and therefore the assumptions they encapsulate are hidden from view and unavailable for analysis. Moreover, it may be precisely these unexamined assumptions that contain the explanation for the success or failure of change attempts.

Opening up black boxes for analysis is in ANT called *translation*. In relation to language teaching and learning this terminology is unfortunate and may give rise to misunderstanding, but in ANT it has a specific meaning. In simple terms, this involves four stages: *problematization* of a situation; *interessement* (the negotiating that goes on between actants and actors regarding the terms of their involvement in the change process); *enrolment* (the acceptance of terms of involvement, or conversely the taking up of positions of opposition or resistance, or the demand for different terms of involvement); and *mobilisation* of allies as actors form groups with shared interests, and appoint representatives to speak for them. (And sometimes, of course, representatives may be self-appointed, a phenomenon in itself which may be subject to ANT analysis.)

An ANT model of curriculum change can thus be thought of as a “translation” model (Bigum and Harris, 2004 p. 5). Since roles and relationships are not necessarily fixed in advance by their position in the formal organisational structure but are constantly negotiated through the daily realisation of the curriculum, for change to occur there need to be one or more *translations*. The initial idea for change, in this view, is relatively weak, containing the potential for change, but not yet the power to bring change about. It is only when it captures the attention of one or more groups of actors and is translated into the desire and capacity to act that it begins to gain momentum as an alliance is formed between, at this stage, the idea and the actors. These alliances are not fixed, and may change over time, requiring further translations.

For example, suppose a teacher identifies that there is an issue with assessment. Should the assessment be purely based on language abilities, or should it encompass effort and improvement?

In order for this initial problematisation of the issue to lead to change, there needs to be a 'translation' into a willingness to act, or at least in interest in taking action. This *interessement* might involve the teacher proposing some solution, or some means of investigating the situation, and seeking other teachers to take part in discussion, or trying to raise the issue with the administration. If this stage results in sufficient support to proceed further, the *enrolment* stage might involve groups forming in favour of or against specific actions, and *mobilising* to actually carry them out (or to oppose them). For example one group might set up a trial assessment system for their classes; or the administration might issue guidelines for assessment criteria. Some entities (participants in the situation) might agree to act in support of, or against, these trials; others might remain neutral, declining to *enrol* one way or the other. And of course while many of these entities will be human, non-human ones too will have an influence on what happens. In this example, the existence of, say, an easy-to-use set of test items, or a multiple-choice test template might exert a strong influence on how the change does or does not proceed.

Dinan-Thompson (2005), also working within a translation framework, uses the notion of *intent*, as a means of understanding change. She contrasts this translation framework with a diffusion framework, in which curriculum change originates at the top of an organisation and is diffused within it by conscious actions carried out by curriculum managers and coordinators. While diffusion frameworks assume that formal statements of intent, such as curriculum documents, are critical and that stakeholders accept them as fixed, translation frames assume that intentions are more various and more susceptible to change. In both frameworks, intentions can lead to either junctures or disjunctures, but a translation frame, to the extent that it foregrounds intentions in all parts of the network, "is able to provide richness to the analysis of interactions [and] ... to demonstrate complexity, contestation and vulnerability" (Dinan-Thompson, 2005, p. 149).

To summarise, then, an ANT analysis of a curriculum change consists in opening up a black box by problematising some issue that hitherto was stable and may or may not have been identified as a problem; a process of negotiation amongst potential actors (actants) concerning their terms of engagement (to what extent they agree to be part of the change), enrolling some of these actors as supporters or opposers, and finally through mobilising support, acting to propel (or resist) the proposed changes. At the end of this process a new stability emerges, which may be seen as a successful change, or may represent failure to change, and the continuation of the status quo.

### **Case study: CALL, Self-access and Monitoring**

*Granny nodded. 'There's always a story,' she said. 'It's all stories, really. The sun coming up*

*every day is a story. Everything's got a story in it. Change the story, change the world'*

(Pratchett, 2004, p. 238)

Implementing a CALL program and monitoring the effects on student outcomes: this is the kinds of issue that are the stuff of educational journal articles, and there are conventional ways of discussing such issues. We might expect to see tables and graphs based on survey data, examination results, curriculum documentation and so on. We very likely expect a careful selection of only the most objective data, and a dry, depersonalised academic register. These accounts are not usually thought of as 'stories', but in fact that is just what they are, and the conventional style of telling these stories is just one kind of storytelling. ANT analysis recognises this, allowing us, and perhaps encouraging us, to look beyond the conventional register for ways of telling the stories so as to reveal what would otherwise remain hidden. This case study, therefore, is an attempt to tell the story in a way different from the conventional way, in an attempt to understand it better.

### **Methodology**

This project is best described as an ethnographic case study, with participant observation as one, but not the only, method of data collection. The story takes place within the Language Centre in a medium-sized private university in Japan. I was director of the Centre for four years between 2011 and 2015. The project itself began in the second of these four years, though some of the data comes from earlier than that. Clearly a project such as this is at the qualitative end of the Quantitative- Qualitative continuum, and a large part of the data comes from my field notes, and from online and offline discussions with some of the teachers, administrators, and students. However other data comes from a wide variety of sources. The Centre produces public documentation relating to student activities, programs, employment of teachers and staff, infrastructure, and so on. In addition, the CALL software generated its own data, manuals, study records, and records of hardware and software issues. Consent was obtained from all participants.

The Language Centre was an administrative department of the university charged with managing all foreign language classes. Ninety per cent of these classes were the basic English language classes required of all first and second year students in the university, around 500 classes per semester. One aspect of the Centre's work concerned how to deal with students who failed the required classes, and this issue is the focus of this case study.



In order to deal with the problem of how to provide opportunities to repeat classes for those students who had failed them the first time, a CALL program was instituted. Somewhere in the region of two to three hundred students each year, around 10% of every class on average, were required to re-take classes, in most cases more than one class. If these students were simply slotted into existing classes there were several administrative, classroom management and educational problems. Therefore a system of repeater classes had been operating. These were classes specifically for repeating students. Since there were a total of 8 different required English subjects (English1, English 2, English 3 ... and so on) there needed to be at least four or five classes for each of these subjects. In part this was because of the scheduling overlap between first year classes and those for subsequent years: each subject needed several time-slots in order to allow students to fit them in with their other subjects. Moreover, the failure rate was not equally divided among these subjects: some repeater subjects had such large enrolments that they needed more slots than average, while others had to go ahead even with very small enrolments. As a result there were around 40 classes, averaging fewer than 20 students each, less than half the number in regular classes.

In Japan, student fees are paid on a flat rate per-semester, rather than on a per-class basis, so each repeater class with a below average enrolment represented a theoretically unnecessary drain on the budget. In addition, given that the most common reason for failing an English class was simply lack of attendance, the classes could not be streamed by ability as the regular program was, but often contained students at widely varying levels of ability. For both these reasons the absentee rate in the repeater classes themselves (and therefore the failure rate too) was higher than in other classes. This high absentee rate in turn had a negative effect on classroom dynamics, which in turn had a tendency to push some classes into a vicious circle of decreasing student satisfaction leading to even more attendance problems.

In response to these twin issues of high cost and low student satisfaction, a CALL program was set up. The CALL program had a number of advantages. First, it reduced the number of classes (and teachers) from 40 to 15 or so (university regulations still required one or more classes for each subject); and second it allowed students to work at their own pace and at their own level, thus reducing the dissatisfaction hitherto felt by some students as a result of dysfunctional classroom dynamics. The program was therefore successful in both reducing costs, and in reducing student dissatisfaction.

The CALL program was a complete self-study program, comprising 12 or so highly structured programs ranging from absolute beginner to advanced level, and covering a variety of different thematic areas, from basic conversation to business English, TOEIC preparation and so on. On enrolment, students took a placement test and were given suggestions as to which programs

were suitable for their level and interest. Then, after consultation with the teacher they decided on one of these programs, and were then free to pursue the program at their own pace, consulting the teacher only if problems arose. In any one classroom, then, since each student would be working in front of their own monitor on their own program, classroom dynamics became a non-issue. Assessment was based on completion of 15 hours of study time, as measured by the software, together with satisfactory completion of a set number of units, each with its own mastery test. Students could therefore choose to complete the program in class over the 15 week semester, or, by working outside the classroom, those with a strong sense of purpose could easily complete within three or four weeks, but using the software out of class in one of the university's computer laboratories. (The software is now available online from any location, but at the time could only be accessed via the local server.) Those who had ended up in the program through poor attendance were able to succeed in this kind of environment; another significant group, those who were socially ill-at-ease with the communicative nature of many classrooms also flourished without the requirement to take part in groups; and a third group, who failed simply through lack of English ability, were also advantaged by having the software select for them a program tailored to their current level.

Nevertheless there were several areas of contention, and aspects of the implementation of the program in practice which differed from the expectations of one or other of the actors involved. An ANT approach to examining these areas starts by identifying the nodes in the network: who and what are the actants. The human actants were, of course the teachers and learners, together with the administration staff responsible for timetabling and teacher allocation to classes, as well as members of each faculty of the university, as represented through the Language Centre steering committee. Technical staff who managed the computer facilities and who were responsible for troubleshooting technical issues and liaising with the software owners were also involved, as were library staff who dealt with the issue and return of notebook computers. Non-human actants were also numerous. There was the physical infrastructure: the classrooms, language laboratories, servers and monitors, students' own personal computers (and later smartphones and tablets); there was the software itself, and other required software such as the EXCEL spreadsheet that was developed to monitor enrolments and progress for the purposes of credit awards, and the language lab software that allowed teachers to monitor student activity in real time; there was the university regulatory framework which dictated how enrolments, attendance, assessment, and so on can take place and can be accredited. And then there were intangible ideological actants: views on what constitutes an educational good; on the respective value of individual study and group study; on technology-mediated learning; on the roles of the target language (English) and the language of the surrounding

environment (Japanese); and finally on the positions of native English language speaking teachers and native Japanese language speaking teachers.

It should be clear that anything approaching a comprehensive analysis is far beyond the scope of this paper. However, for the purposes of illustration, let us take just one small issue that became problematised: the issue of attendance in class. Poor attendance, as we have seen, was a frequent cause of failure to gain credits. Poor attendance was formally penalised in most language classes as a result of a Language Centre policy requiring teachers to fail any student with four or more absences in a semester. Poor attendance also jeopardised a student's chance of getting a sufficiently high score since it resulted in missing out on key information and learning opportunities. A CALL system which encourages independent work at a student's own pace addresses both of these problems by allowing students some latitude in attendance, and by situating the learning opportunities so that they are accessible irrespective of attendance in class. Student evaluation surveys showed that this was indeed valued by the majority of students. Most, but not all, teachers also rated this aspect of the program highly. Those who did not were somewhat invested in the notion that attendance is a good in its own right, and in the convention that the good attender is *ipso facto* a good student. Some students, then, to the extent that they took a position on attendance, either by requesting a relaxed approach from their teachers, or simply by enacting a pattern of attendance that would not be allowed in other classes, became actors in the situation, as did the teachers, either through advocating a lenient policy or opposing one. Other human actants were the higher level administrative staff of the Academic Affairs Office, members of the steering committee of the Language Centre, and other teachers not formally involved in the program.

Of the non-human actants-become-actors, the most unequivocal was the software itself, designed as it was not in fact for classrooms, but for self access. Another was the timetable itself, and the process by which it was (re-)constructed each year, and yet another was the set of university regulations concerning enrolment in classes, attendance requirements for language classes, and credit award requirements. We can say, in ANT terms, that as the issue was problematised through a proposal to enact attendance requirements in a flexible way, a period of *interessment* started, as some teachers expressed interest in taking part, while others requested not to; the software and hardware were engaged; and then some teachers and some administrators were *enrolled* in one side or another of the issue. Some, particularly those with a background in CALL and independent learning, or those with a predisposition for "thinking out of the box" aligned themselves with the software, and on the side of flexibility; others, particularly those for whom the letter of the regulations was relatively important, aligned themselves with the more conservative approach.

It might appear at first glance that this attendance issue was relatively simple: the Centre management could simply decide on a policy and implement it through its employees, the teachers. Indeed this was the view largely taken by the non-teaching part of the administration. This is one reason why we can think of the issue as a ‘black box’: attendance was seen as simple, unproblematic, and unrelated to learning styles. However, when we look at the network around the issue it is not nearly as simple as it appears.

First, discussions with both teachers and students revealed that in fact there was considerable variety in the way that Centre policies were implemented in practice, across the whole spectrum of classes, not only the CALL repeater ones. The Centre policy itself was somewhat complicated. Teachers were required to fail students who were absent for four or more classes. However there were some exceptions where students were absent for official university events, such as sports or club activities, or for certified illness. In these cases students were required to obtain a certificate of official absence from the university administration office, and present this certificate to their teacher. However, some teachers and students treated doctor-issued medical certificates as official absence certificates, in contravention of the Centre policy, which was that students needed to take their doctor’s certificate to the administration office and receive the official absence certificate, which they could then give to the teacher. In other words, the authority to approve or disallow an absence due to illness rested in the administration, not in the teacher. In some cases this regulation was simply misunderstood. For one thing, the certificates look similar, particularly for teachers who do not read Japanese. For another, teachers differed in their interpretation of the respective weights of the *intent* and the *letter* of the policy. In other words, some teachers believed that since absence was allowed in the case of illness, it was within their own authority to accept a doctor’s certificate as evidence for that. Some teachers went further than this, and were willing to accept a student’s word alone, without any certificate.

Second, some teachers were stricter than others in the way they defined ‘absence’. For instance a common practice was that students were marked late up to 30 minutes after the start of the lesson time, and absent thereafter. Some teachers treated two late arrivals as equivalent to one absence, others did not. In addition, the level of strictness in implementing these criteria was also variable, with some teachers strict to the minute, and others much more easy-going. Not only that, some teachers were willing to accept some kinds of out-of-class assignments as equivalent to attendance, in some cases, for example where they judged that a student was in danger of failing on attendance grounds, but in other respects was performing well.

In addition to these kinds of teacher issues, students also exerted influence. In ANT terms, some students (actants) *translated* their potential to influence the situation into actual influence:

they became *actors*. For example, students might negotiate with their teacher over whether a specific instance (of lateness, say) constituted an absence or not. They might do this through argument, appeal to the teacher's generosity, and so on. On the other hand some students became actors in pushing for greater strictness from relatively non-strict teachers, on the grounds of fairness, or of conscientious attendance as an educational good.

A somewhat different area of contention surrounded the Centre attendance policy itself. Here there were other human actors in addition to the teachers, students, and administrators, in that curriculum policy changes require approval of several university-wide committees, included the Centre steering committee. Not only that, the non-human actant mentioned earlier, the CALL software, was also a powerful influence. One factor in this influence was that since the software strictly recorded each session of use, it had the potential to change the very definition of attendance. Students could use the software from home at any time, and their engagement with it was recorded. This means that it measured not simply their presence in front of the computer or phone, but the degree to which they engaged with the learning material. It could be argued, and in fact was argued by proponents of a flexible approach to actual classroom attendance, that this constituted a richer and educationally more valuable definition of attendance than a classroom roll-call. On the other hand, other non-human actors were two university documents: the Centre attendance policy itself, and the university-wide document which specifies what constitutes a credit-bearing subject. The latter defines language classes as belonging to the group of subjects for which 30 "class-hours" are required for one credit. This specification is usually taken to entail fifteen ninety-minute classes, together with thirty minutes of preparation or post study time for each class. The CALL system, which in principle does not require attendance in the classroom, and which defines engagement in a different way, clearly exerts and influence in a different direction. These two physical entities, then, attracted the support or opposition from other human entities.

In short, this black box of class attendance, in an ANT analysis is revealed as much more complex than it at first might appear. This is not to propose that university administrators and teachers should be engaging in ANT analysis, of course, but it does suggest that an understanding that curriculum processes are complex, and a willingness to engage with that complexity in addressing issues might contribute to better managing organisational change.

The program began its implementation with this issue unresolved, and it continued to be a site of contention, as actors were mobilised into groups according to their shared interests and intentions. Along the way there were critical points, skirmishes, where one side or the other enrolled new actors, or existing actors positions or status changed. For example, after one software update there was a string of software (or hardware) glitches. Some students found inaccuracies in

the records kept by the software owner's servers. Along the way to the resolution of these problems, the status of the software as a trustworthy guarantor of the rigour of independent learning was compromised, and some students' and administrators' support for the program as a whole was likewise weakened. On the other hand, the online end-of-year student evaluation survey, which showed overwhelming satisfaction with the program also caused some re-alignments: some teachers who had been sceptical of the program came to think of it in a more positive way.

The program continues to operate, with the attendance issue, and others, still patched over rather than resolved, but nevertheless stable. New actors occasionally enter the arena, as when one of the co-ordinating teachers was invited to speak at an overseas conference about the implementation of the CALL program. The fact of outside interest in what had until then appeared an entirely internal situation, once again re-arranged (*re-mobilised*) alliances, strengthening one group and weakening others.

### **Conclusion**

This paper has been an attempt to outline briefly what Actor Network Theory is, and how it might offer a productive tool for helping us to understand how change takes place in educational settings. Conventional accounts of curriculum change tend to focus on the kind of quantitative data that is easily measured and collected, to the exclusion of the perspectives, conscious or not, of the many entities involved in the change, as well as the mutual influences these entities have on each other. Educational practices are mobile, as Fenwick points out (2012, pp. 367-368):

Actor-network theory offers concepts that illuminate dynamics of educational reform often left aside by these more structural or socially-focused analyses—including how actors emerge within the play of heterogeneous linkages among humans and nonhumans, and how the different actors that appear are performed into being by these linkages.

The corollary of this mobility is that organizations cannot operate in a constant state of flux. Some level of stability is essential for continued functioning. The core of ANT, therefore lies in trying to understand “how actors and organizations mobilise, juxtapose and hold together the bits and pieces out of which they are composed; how they are sometimes able to prevent those bits and pieces from following their own inclinations and making off” (Law, 1992). The small case study described here illustrates well a situation which preserves a measure of stability, even while key elements of it are contested. It may be that this is the norm in many educational organisations in these days of constant managerial intervention, and ANT offers a potentially powerful means of

understanding how these tensions play out, and how successful interventions can lead to states of stability and to teaching and learning spaces more satisfying to all involved.

### Notes on the contributor

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