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Diffusion of innovation through formal institutional networks

Cornelis Adrianus (Kees-Jan) van Dorp¹ and Andy Lane²

¹ European Association of Distance Teaching Universities, the Netherlands

² The Open University, United Kingdom

Key words: *Diffusion, innovation, open educational resources, networks, adoption*

Abstract:

This paper reviews and reflects on institutional OER development practices along the dimensions and models of collaboration and innovation within communities and networks of practice, and provides insights as how to improve the diffusion of OER through institutional networks. It does so by examining two cases:

Case 1 MORIL:

The EADTU has been working on sharing and developing institutional OER strategies by means of a taskforce on Multilingual Open Resources for Independent Learning (MORIL). The US-based William and Flora Hewlett Foundation acted as a financial catalyst to initiate a Network of Practice within the participating institutions and which is being extended through a grant from the Erasmus Lifelong Learning Programme in the strand Virtual Campus.

Case 2 TESSA:

The Teacher Education in Sub Saharan Africa (TESSA) programme is a research and development initiative creating OER and course design guidance for teachers and teacher educators working in Sub-Saharan African countries. TESSA is a consortium of 18 national and international organisations including 13 institutions in Sub-Saharan Africa who are using the TESSA materials in a variety of teacher education programmes. The major funding for TESSA has come from the Allan and Nesta Ferguson Charitable Trust and the William and Flora Hewlett Foundation.

1 Introduction

Open Educational Resources (OER) are defined as ‘teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge’ [1], and are being created and used throughout the world through the utilisation of digital technologies and open licences. In many cases it has been major institutions such as MIT that have been at the forefront of publishing OER but equally there are a growing number of individuals who are experimenting with the creation and use of OER. However the total number of institutions creating and using OER are still small compared to all those who could be involved and inevitably these early adopters have been attempting to collaborate in an area which is based on the philosophy of sharing (e.g. see www.ocwconsortium.org). Equally,

while the sharing of OER has been the original focus of everyone involved it is increasingly recognised that it is more about open educational practices and how openness is influencing the way institutions teach and students learn (see [2], for a review of open educational practices and resources). As an innovation themselves and as a prompt for further innovation it is necessary to look at what features might support the successful diffusion of this innovation amongst institutions rather than individuals. To do so we first review some of the literature relating to the adoption of innovations as well as about communities and networks of practice. We then review and reflect on two contrasting case studies where institutional networks have been critical to innovation diffusion and adoption.

1.1 Adopting innovations: a frame of analysis

Diffusion of an innovation can be regarded as a process, an adoption process ([3], [4], [5], and [6]). This process takes place through a series of communication channels over a period of time among members belonging to the same social system. In Roger's Diffusion of Innovations model [3], five phases in the adoption process are distinguished: Knowledge, Persuasion, Decision, Implementation, and Confirmation (Figure 1).

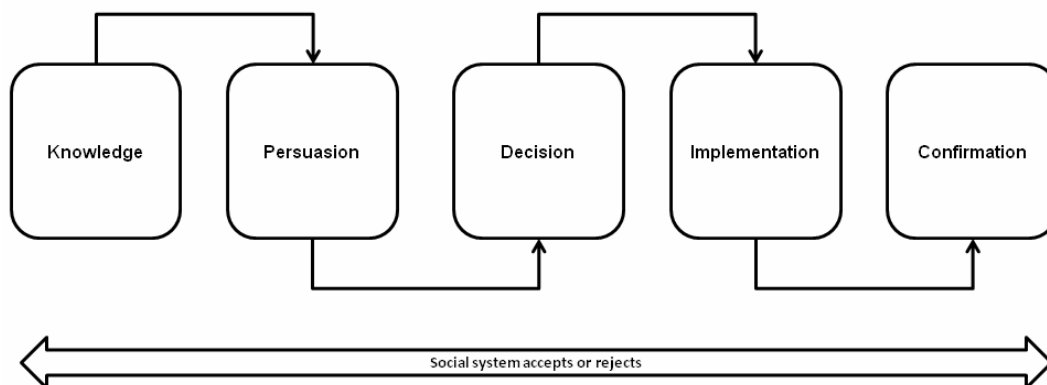


Figure 1 Five phases in the adoption of innovations [3]

In the Knowledge Phase, the individual (or institution) is first exposed to an innovation but lacks information about the innovation. During this phase of the process the individual has not been inspired to find out more information about the innovation. In the Persuasion Phase, the individual (or institution) is interested in the innovation and actively seeks information/detail about the innovation. In the Decision Phase, the individual takes the concept of the innovation and weighs the advantages/disadvantages of using the innovation and decides whether to adopt or reject the innovation. Due to the more closed or less open nature of this phase, Rogers notes that it is the most difficult stage to acquire empirical evidence. In the Implementation Phase, the individual employs the innovation to a varying degree depending on the situation. During this Phase the individual determines the usefulness of the innovation and may search for further information about it. In the Confirmation Phase, the individual (or institution) finalizes their decision to continue using the innovation and may use the innovation to its fullest potential. In addition to this model of adoption, any strategic success of an institution strongly depends on the appropriate organisation of its collective ambition and the presence of core competences. For building and developing new core competences, collective learning is needed according to Hamel and Prahalad [7]. They relate the strategic intent of an organisation i.e., the collective ambition, to the development of core competences

and indicate that when an organisation is not yet successful in an area, but wants to move ahead, an investment is first of all made in strengthening the collective ambition, followed successively by the development of the necessary competences. Figure 2 depicts the relation between collective ambition and the development of necessary competences.

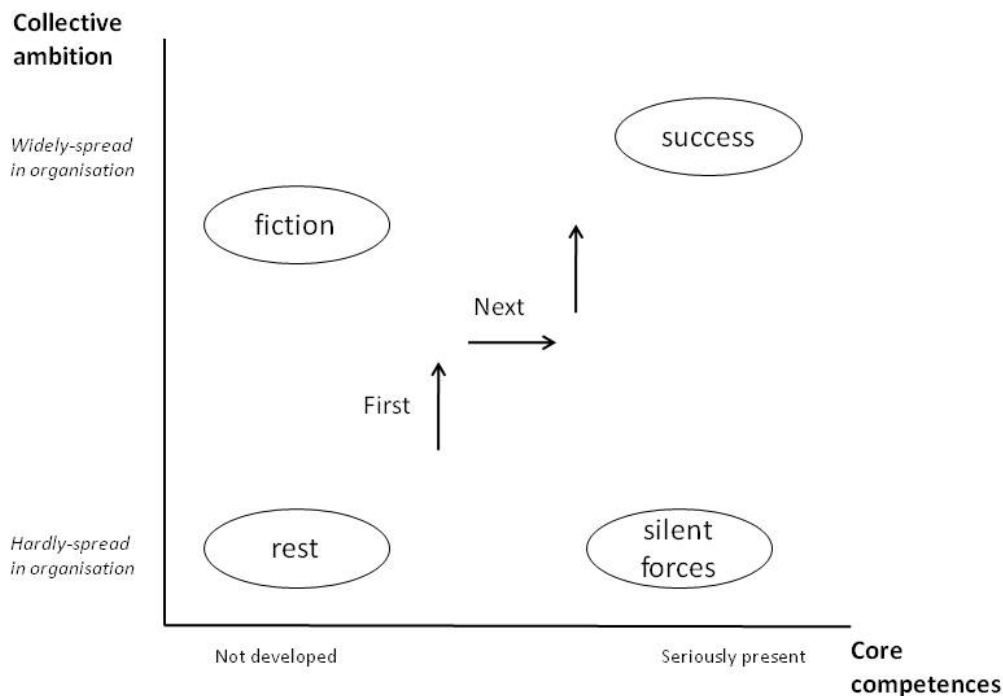


Figure 2 Collective ambition and competence development [7]

1.2 Communities and Networks of Practice: models for collaboration

In recent years there has been a growing interest in communities of practice (CoPs) and networks of practice (NoPs) in connection with informal knowledge gathering, notably in the fields of education and both knowledge management and innovation within organisations, but also in fields such as healthcare and computer science [8]. Although the idea of communities of practice has been around for many years it was first made explicit by Lave and Wenger in their work on apprenticeship and situated learning [9]. Around the same time the notion of networks of practice originated in the work of Brown and Duguid [10], who applied the term to the relations among groups of people with looser connections than expected in a CoP. Lave and Wenger [9] define a community of practice as “*a set of relations among persons, activity and world, over time and in relation with other tangential communities of practice*” (p. 98). In simple terms, communities of practice are groups of people who share a common pursuit, activity or concern. Members do not necessarily work together, but form a common identity and understanding through their common interests and interactions. Many different communities of practice exist and we may all be members of several, for example, through our work or hobbies. They are often informal and self-managed. For some communities of practice we may be a core member, whereas for others we may sit on the periphery. Communities of practice are repositories of explicit or formal knowledge as well as the less tangible tacit, informal knowledge, and hold the key to any form of change process [10]. They are inherently stable and it is this stability that allows learning within and around the community to take place. Wenger [11] identifies three aspects of communities of practice that work together and that may either hinder or enhance learning:

- **Mutual engagement:** members come together because they are engaged in actions whose meaning they negotiate with one another. They develop shared practices and are linked through their mutual engagement in such activities.
- **Joint enterprise:** members work together, explicitly or implicitly, to achieve a negotiated common goal, which may or may not be officially defined.
- **Shared repertoire:** a common history and culture is generated over time by shared practices, stories, tools, concepts and repeated interactions. Writing, routines, rituals, ways of doing things and so on, become a common repository.

There has been a growing academic interest in what happens beyond communities of practice, in the informal or formal organisational networks within which a community of practice may sit. Podolny and Page [12] define networks as “*any collection of actors that pursue repeated enduring exchange relations with one another and, at the same time, lack a legitimate organisational authority to arbitrate and resolve disputes that may arise during the exchange*” (p. 59). Social network theory views relationships in terms of nodes (individual actors) and ties (the relationships between actors) and views the attributes of the individual actors as less important than their relationships (or ties) with other actors [13]. This is distinct from theories about communities of practice, which focus on an individual’s competences and practices. Many networks are viewed as having a structure whereby at the core are those members who are closely tied to each other and at the periphery are members who have more ties to core members than to each other. The concept of networks of practice is distinctive in that it recognises that there may be people beyond an organisation within which an individual is situated, who share their practice or may influence that practice through their own practices. However, like CoPs, members often participate in several networks of practice [14]. Networks of practice have the same features as communities of practice (their subset) but may have weaker ties. What binds the network together is shared practice, and extensive shared practice leads to extensive shared know-how ([10], [15], and [14]), although some of that knowhow may come from exchanges with others outside the network. Whilst not usually applied to relationships between organisations there is no reason why a group of institutions cannot come together as a network of practice if they have shared practices and possibly joint or mutual goals. In relation to innovation, Deroian [16] drawing on the work of others, argues that individuals (and potentially institutions) are embedded in a relational network and the opinion of potential innovation adopters is thus subjected to social influence. Through interactions with other potential adopters, opinions on new technologies are formed and shaped. Therefore, much more is involved than simple information transmission in the adoption of an innovation; it involves revisions of judgements, discussions in a wider practice related or socioeconomic system, and an individual’s receptivity to influence.

2 Case Study 1 MORIL

2.1 Introduction

The European Association of Distance Teaching Universities (EADTU) has been working on OER strategies in lifelong open and flexible learning by means of the EADTU taskforce on Multilingual Open Resources for Independent Learning (MORIL – see <http://moril.eadtu.nl/>) and the European project ‘Innovative OER in European Higher Education (OER-HE). EADTU is the representative organisation of both the European open and distance learning universities and of the national consortia of higher education institutions active in the field of distance education and e-learning and as such its members have shared practices and goals that are often distinctive and different to campus based universities. As an institutional network it is the main voice of the community for open and distance higher education and e-

learning in Europe. EADTU aims to promote the progress of open and distance education and e-learning and its position in Europe and in the world, through active support to the institutional development of its members and to the European wide co-operation between them in strategic areas. The framework for all this activity is the creation of the European Area of Higher Education (Bologna Declaration), the national and European policies with regard to lifelong learning, the development of competencies for the European citizen and the innovation of e-learning and teaching by the use of ICT.

2.2 MORIL in start-up phase

The action to place OER on the agenda of the Board, Rectors' and Executive meetings of the EADTU came from the Open Universiteit Nederland, in an attempt to learn from The Open University in the UK, which was an early adopter of OER [17]. Preparatory work and discussions as to what this would imply for universities commenced. Simultaneously, universities individually started their consultations with experts such as those of The Open University. The experiences were fed back into joint network meetings. The task force on OER was an attempt to learn from the early adopters, obtain insight in the pros and cons of OER, and gain experience with ways of working, sharing, and partnering. The primary objective of the task force was to extend the commitment base at the institutions through dedicated individuals, able to make preparations for the establishment of a consortium of Open Universities dedicated to lifelong open and flexible learning. Aiming at the consolidation of the task force, some significant subjects and perspectives were discussed in depth. Having received commitment from the partners, activities to design a roadmap for the future, commenced, including a lot of effort in dissemination and awareness raising.

2.3 MORIL in adoption phase

Universities only really entered the adoption process of OER when the initiative of the task force received financial support from the William and Flora Hewlett Foundation. The initial OER task force was renamed MORIL in accordance with the name of the proposal which was submitted to the William and Flora Hewlett Foundation. Through the MORIL grant, momentum could be created within the participating institutions and the exchange of ideas about institutional strategies for OER could be sustained. Additionally, a conceptual model with learning modules in three tracks was devised: (1) access to fully open courses, (2) access to additional services like competence assessments and access to learning communities, and (3) access to formal tutoring, examinations and certification. The grant by the William and Flora Hewlett Foundation was used as a planning grant, to (also) try to obtain a second (larger) grant, which could help implement the three-track concept across the MORIL Consortium, and which would foresee funding for all participating partners and stretch the initiative beyond its start-up scope. To write the new proposal, a core group of the task force was delegated to do the essential work. Meetings took place in Brussels, Milton Keynes, Hagen, Heerlen, and in Leuven. While awaiting the outcome of the second bid to the William and Flora Hewlett Foundation, all universities simultaneously continued their own local activities. News came, however, that the bid to the William and Flora Hewlett Foundation would not be accepted in its current form. A renewed (second) proposal was submitted, which focused more on the valorisation of the lessons learned and their dissemination towards other universities and networks inside and outside Europe. This proposal was accepted by the William and Flora Hewlett Foundation and enabled EADTU to organise a series of best practice seminars related to OER strategies, dissemination and capacity building. EADTU (also) obtained organisational and financial support from both the European Commission and UNESCO for this approach.

The first seminar i.e., the strategy implementation seminar, took place in May 2008 at the Open University (UK) in Milton Keynes, and was intended for high-end representatives of the Open Universities. Integral cases by the Open University i.e., the case of OpenLearn (www.open.ac.uk/openlearn) and the Open Universiteit Nederland (the case of OpenER – see <http://www.opener.ou.nl/>), were discussed, dealing with issues like: strategy, sustainability, technology, IP, curriculum, academic participation, quality, and organisational structures. In addition, various institutional approaches of open and distance teaching universities were assessed, using compendium mediation and force field analysis [18]. The second strategy development seminar was held on October 28-29 2008 in Leuven. It aimed to facilitate knowledge transfer between regular universities and open and distance teaching universities as far as OER (best) practices were concerned. It succeeded in its mission by presentation of institutes leading in OER throughout Europe, including panel discussions with representatives of universities and the European Commission. The seminar lived up to the expectations of both regular universities and representatives of university associations. The third seminar was held on March 12-13 2009, at the UNESCO Headquarters in Paris. It was headed by Georges Haddad: Director, Division of Higher Education, UNESCO. The objective was to explore the potential of OER for improving the provision of education in Africa, Arab States, Asia, the Pacific, and Latin America, incorporating the development of relationships with regional and global networks. The seminar had also been organised to provide input to the ICDE/EADTU Conference (Maastricht, June 2009) and the 2009 World Conference on Higher Education organised by UNESCO (Paris, July 2009).

2.4 Towards extended adoption

Innovations such as OER are valuable for the masses, yet to date have resisted diffusion in many educational institutions. To sustain the process of adopting OER, and to avoid slow movers from developing an innovation gap, a new European project has been formulated by EADTU. This new European initiative is meant to additionally stimulate institutions to reach a tipping point, by enabling them to continue learning from fast movers. The new project has been approved under the lifelong learning programme, within the strand Erasmus. The project 'Innovative OER in European Higher Education' (see <http://www.eadtu.nl/oerhe/>) now includes 11 European partners. The project is organised into five study work packages: (1) Widening participation i.e., best practices, (2) Multi campus i.e., education associations, (3) Internationalisation i.e., team based development, (4) Quality in OER, and (5) a European course portal. The project enables partners to follow the innovation cycle as regards the successive phases of awareness raising, strategy building, institutional frameworks, pedagogic models, business models, and pilot experiments. The project valorises all partners' practices to date and disseminates the successes. The project also delivers a manual on how to deal with OER development.

2.5 Case analysis and conclusion

Almost every open and distance teaching university participated in EADTU taskforce meetings and gatherings. Mostly all started at the beginning of the innovation cycle. However, it was the authority of key people and their ability to spread information about OER within the own institution that often played a significant role in adoption. From OpenLearn it was learned that OER could be made functional in the context of university strategies. OER at the OU UK had been lifted to the level of university policy. With OpenLearn being part of policy, other departments were stimulated to become involved as well, making the spread of OER skills and competences throughout the university far easier. The involvement of university

Board members in the acceptance and adoption of OER was crucial in this process. Those members which participated in EADTU meetings but had little scope to influence university policy on their own, may have experienced success in exploiting OER on the local departmental level, but experienced great difficulties in scaling up merits to the university as a whole. However, all participating members of the MORIL task force did express a certain passion and willingness to make it an institutional success, as well.

In reference to the innovation adoption model of Rogers, we conclude that some institutions had problems, especially in the persuasion phase. The person(s) that needed to persuade the university Board often did not stand in direct relation to that Board, causing an acceptance barrier. With high-level involvement from the first phase onward, such a problem was notably smaller. Turning to the theory of collective ambition and the development of core competences in the case of OER, the bottleneck with many institutions is the mobilisation of the collective ambition, whereby many OER projects remain local and don't reach top management. Because of this there has been little opportunity for core competencies to be developed. According to Hamel and Prahalad [7], top management must be involved in developing a robust programme for institutional competencies, and must be in place for at least five years. Within MORIL, intermediate changes in top management have reset the process of adoption within institutions, several times. The ability of a university to scale up merits of successful innovations apparently has a lot to do with authoritative persons and governance. As noted for MORIL, some task force participants had direct relations to the University Board and/or were themselves Board members or Rectors. Others acted as representatives or were staff members from departments within the university. The composition of the task force, which was not homogeneous but rather heterogeneous, made a future assessment of the impact on institutions, difficult.

At this moment, only a few distance teaching universities have incorporated OER in their institutional strategy. As a result, some universities remain climbing the ladder. However, the processes of MORIL do seem to have created a nascent Network of Practice where the opportunities to interact and share information and knowledge has sustained the consideration of OER as an innovation throughout EADTU and also into other networks. Because of this, in 2010, the EADTU launched an extended adoption phase, co-funded by the European Commission, intended to safeguard slow movers from an upcoming innovation gap.

3 Case 2: TESSA

3.1 Introduction

This case study is heavily based upon the account in Wolfenden [19] and related publications. Over the last four years the Open University in the UK has been involved in an audience specific OER programme; the Teacher Education in Sub Saharan Africa (TESSA) initiative (see www.tessafrica.net). TESSA is a consortium of institutions concerned with the collaborative production of original OER to support teacher development. The major funding for the TESSA initiative has come from the Allan and Nesta Ferguson Charitable Trust and the William and Flora Hewlett Foundation.

TESSA has five distinct characteristics. First, it is a global consortium, including organisations like the BBC World Service Trust and the Commonwealth of Learning, as well as the South African Institute for Distance Education (SAIDE), but focussed on the needs of teacher education in nine African countries. TESSA is a consortium of 18 national and international organisations including 13 institutions in Sub-Saharan Africa who are using the

TESSA materials in a variety of teacher education programmes (for further details see [TESSA in Use](#)). Second, as an OER initiative it is unique in being audience specific to teachers. Third, in TESSA the user, the teacher educator, has been at the centre of the initiative. The vast majority of the OER have been created collaboratively by teacher educators from across Africa (over 100 authors have been involved). The developments of both materials and the portal have involved extensive consultation with potential user groups building on local knowledge, materials and approaches. In contrast most OER projects transfer materials from existing courses to an open platform; often materials in each course originate from only one or two authors. Fourth, the TESSA initiative is creatively exploring the use of OER audio content. Both different formats – drama, interviews, features – and modes of delivery including radio, CD and use of mobile phones. Lastly significant time and resources is being put into the implementation and use of the resources, an aspect given insufficient attention in many OER initiatives [1].

3.2 TESSA design and dynamics

In TESSA the project design has allowed the consortium to look in detail at issues such as adoption of the resources for different environments and how best ‘users’ can be supported in understanding ways of integrating the materials into what have been termed ‘learning pathways’. TESSA development teams are actively exploring issues of reuse and interoperability. Colleagues across the partner institutions have not been seen as consumers of imported educational material but rather as collaborators in content production, distribution and utilisation. Awareness of the current situation in these institutions together with likely short and medium term contexts for exploitation has been at the centre of TESSA OER development.

The dynamics of the TESSA consortium can be represented Figure 3: All eighteen partner institutions contribute to the strategic direction of the initiative through regular workshops, meetings and electronic discussions. Each partner institution is represented on the ‘Partner Advisory Council’ (PAC), the key governance forum for TESSA activity. Support for PAC is provided by a group of academics and administrators from The Open University, UK. Working in a consortium across several countries inevitably brings challenges of coordination and communication; these are vastly increased by the unreliable and uneven infrastructure found in much of sub-Saharan Africa. Regular workshops in different locations across the region have been pivotal in maintaining momentum, building relationships and shared understandings.

Work around the four areas of activity - research, technological development (the TESSA portal), curriculum (TESSA study units) and take up - is determined in detail by a smaller working group for each area. Different partners input to different areas of activity. Some, such as the BBC World Service Trust, have been involved almost exclusively with only one sphere of activity, in this case production of curriculum materials. Other partners have contributed to several strands of activity, represented by the links on the diagram above. All thirteen institutions in Sub-Saharan Africa involved in teacher education have contributed to activity around implementing use of the OER in courses and programmes. Central to this model is the multi directional interplay between the concurrent different strands of activity. The structure and nature of the curriculum, for example, has been informed by planned contexts for use (take up), by the forms of technology available for distribution (technical) and by research activity within the project. The latter has included fieldwork exploring the lives of female primary school teachers living and working in rural or semi-rural areas in Ghana, Nigeria, South Africa, Kenya and Sudan.

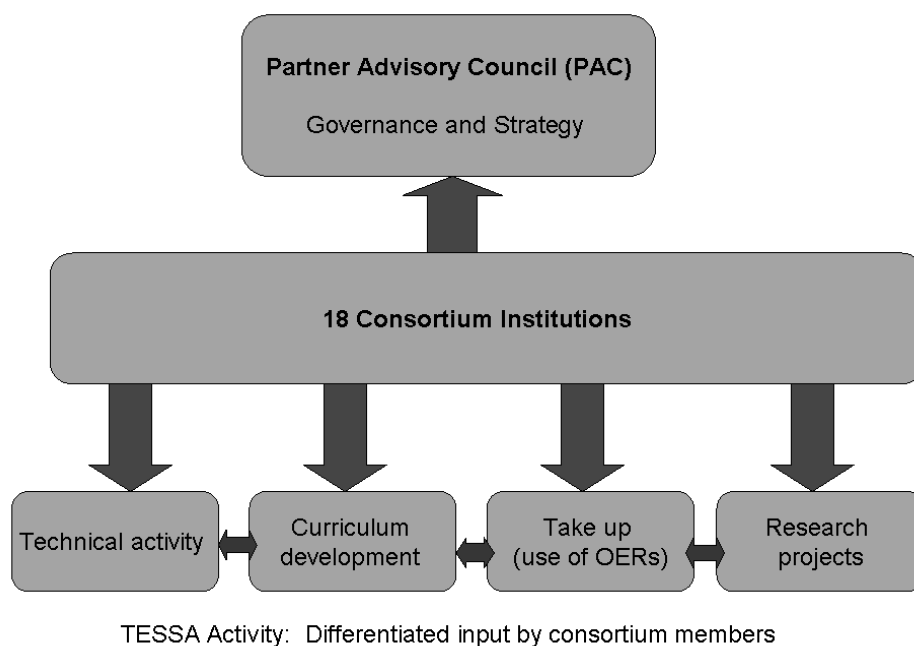


Figure 3 TESSA organisational structures [19]

3.3 Case analysis and conclusion

As with the MORIL project this network of practice started with a desire to share the knowledge and experiences of an early OER adopter – The Open University. Many of the participants were aware of OER but The Open University played a big role in persuading partners that OER were a necessary part of the initiative (when the programme first started OER did not feature strongly at all) and as described in the case the decision to adopt OER became central to successful implementation of creating and sharing resources for teacher education. In fact the whole process of educational resource creation and use was a major innovation for most of the partners and it was the open licensing and judicious use of technologies alongside workshops and meetings designed to share information and knowledge about these practices that helped develop the core competencies within the organisations once the collective ambition was achieved. Equally the collective ambition within and between the partners was aided by the fact that the consortium aim was the creation of the common resources and shared understanding of educational practices that then enabled different partners to go on and use the OER for a variety of other purposes. This has led to extended adoption of OER and extended practices amongst some of these partners without the need for additional external grant funding. However it has to be acknowledged, just as with the EADTU network, external grant funding can be critical in maintaining the momentum of adoption and sustaining the Network of Practice. It is also the case that the structure and governance arrangements for the consortium, working variously across a number of activities, has been important in developing both Communities and Networks of Practice amongst the partners which is also being carried over in some cases to the work of individual partners in particular countries. In fact, while EADTU is a long established network compared to that created specifically and more recently for TESSA, the very openness of OER and associated open educational practices means that people are more likely to be aware of them, can more readily find out more information and see examples of adoption by others (including the reasons for doing so) and how they have implemented the innovation [20]. At the same time

the common goal or joint enterprise represented by distance teaching or teacher education in the two cases moves the relationship on from one of just cooperation to greater collaboration amongst the members of the institutional network. So while these were formal networks for the common purpose the openness also enabled aspects of informality between members in sharing information about innovations.

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