A Theory Based Dialogic Learning Architecture for Sustained Innovative Collaborative Learning Across Diversity and Professional Borders

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Abstract. This paper addresses theoretically the challenge of establishment of a networked learning architecture appropriate for the sustained design of both continuing and professional education. Bringing in theoretical concepts, together with affordances of digital technologies, and using an action research meta-methodology of critical research, the paper attempts to elucidate make transparent the type of considerations and discussions needed as a prerequisite for forming a general concept/model for pedagogic design for professional and continuing education. The study finalizes with a suggestion for a conceptual model for producing innovative learning processes within professional and continuing education.

Keywords: Learning design · Learning as negotiated identification
Collaborative dialogue · Virtual environments · Innovation · Creativity
Digital Dialogue (DD) · Collaborative Knowledge Building (CKB)
Agency · Meta-learning · Networked learning · Empowerment

1 Introduction

Today's continuing and professional education curricula focus on teaching/learning of subjects and competencies. At the same time, increasingly, they emphasize *creative* and *innovative* construction and implementation of *new knowledge*, new processes and new production:

> Within professional education a recent shift has taken place. Professional education has moved from specialized education and update of professional knowledge, over competence-based education, to, recently, education with goals such as creativity, innovation, intrapreneur- and entrepreneurship. OECDs Centre for Educational Research and Innovation (CERI) reveals this tendency. The core idea here is that education, in a very goal-directed way, supports initiatives, which - in turn – results in added-value to society. [1:22]

Learners are expected to learn *something*, *learn-to-learn*, and learn to *produce and implement the new* in their professional practices.

Existing educational concepts, pedagogies and methodologies, as we know them, are not in sync with this need of our current and future society [2]. Their loyalty is directed towards the past. They rely too heavily on "conservative thinking" in that they

are almost entirely informed by and based on the knowledge society has already acquired, and not on visions of a modern society casting a glans to the future. Novel, sustainable concepts need to incorporate strategies, which not only generally fit a modern society, but also more specifically allow data from the future to be incorporated – continuously as they emerge [3, 4].

However, digital technologies, including Networked Learning, Open Educational Resources (OERs) and social software, make it possible to renew pedagogical thinking and learning designs and envision the scope of action of learners [2, 5], during their education not only as *producers of knowledge*, but also as *consumers of the same* [6]. In particular, Virtual Learning Environments (VLEs), are often characterized as having a non-hierarchical infrastructure in the communication process [7]; In any case, as confirmed by Dalsgaard [8], the educational potential of digital technologies and environments cannot be disputed. One clear and concrete design potential of e.g. VLEs is their ability to enable and provide structure to a communicative process that transcends physical borders.

Nor can it be easily overlooked, as also noted by [9] that the ability of VLEs for facilitating communicative interactivity amongst participants, is an essential feature that invites and supports *learner empowerment* and *learner agency* – provided the learning design as well as the underlying pedagogic values and techniques [9] are also inclusive and widening participation [10]. The possible initiatives of learners are strengthened in two ways: *Dialogic participation* and *democratic negotiation*, and *creation and sharing* of knowledge and digital resources [11].

This paper shares these values. It is based on a view of "learning as negotiated identification", a learning concept, launched by Oestergaard and Sorensen [1]. The concept entails/comprises a learner identity as an active democratic-oriented citizen as a meta-learning output of the learning process [12], and is associated with (1) agency and communicative initiative, (2) digital dialogue and collaborative knowledge construction, (3) open educational resources.

The intention of this paper is to take the concept of "learning through negotiated identification" one step further and provide a theoretical argument for an inclusive learning design for the future, aiming at facilitating negotiation and inclusive collaboration between stakeholders and thus involving the say and perspective of all stakeholders involved. The paper concludes with a suggestion for promoting an understanding of networked teaching and learning as, essentially, situated processes of negotiated identification, inspired by Sorensen and O'Murchu [4] and Sorensen and Brooks [11] and suggesting a conceptual model in the form of a digital learning architecture, adapted to and directed towards sustaining innovative networked teaching and learning within professional and continuing education.

2   Methodology

This methodological approach of this study is qualitative and situated within the constructivist paradigm. Building on the experience and insights from earlier research, the paper explores an identified problem that becomes elucidated through a theoretical

lens - a kind of overarching theoretical umbrella, which provides a framework for the theoretical discussion and argumentation: The research framework of Skovsmose and Borba [13].

2.1   Skovsmose and Borba

Skovsmose and Borba present a kind of action research, "participatory research", in which they incorporate a theory of "critical research that investigates alternatives". In other words, research that is directed towards hypothetical situations (in contrast to, for example, grounded theory):

> "Critical research designates the analytical strategy aiming at investigating imagined educational situations based on studies of particular arrangement, representing the imagined situation" [13:17]

Skovsmose and Borba underlines that action research is a cyclical process, which evolves through "acting-observing-reflection-change-planning-acting" [13:8-9]. Their framework (Fig. 1) operates with three different situations: "current situation" (CS), "imagined situation" (IS), and "arranged situations" (AS). CS describes the status of the situation as it appeared before the initiative; IS describes a hypothetical ideal situation that provides future directions and wished intentions, and AS the situation that gets arranged with IS in mind. In between the three corners/situations (CS = current situation, IS = imagined situation, AS = arranged situation) of the model, the lines indicate processes (PI = pedagogical imagination, PO = pedagogical organization, CR = critical reasoning).

Pedagogical imagination (PI) – the key focus in a learning design - is concerned with what is captured within the dotted line in the model. What remains outside the dotted line, could potentially be the focus of a Design Based Research (DBR) project [14] with imagined situation (IS) in mind. In the present study, the research momentum is situated in *"Critical reasoning" (CR),* where arranged situation (AS) is compared with IS and simultaneously viewed in the light of PI and PO that underpin the two situation.

The model of Skovsmose and Borba (Fig. 1) constitutes a way of structuring pedagogical development and research work. Departure is taken in the situation in question, which needs to be changed, and the implementation of the change is facilitated by incorporating the people affected by the implementation. The process of change is guided, partly by a vision, and partly by the contextual pragmatic conditions for change.

The remaining theoretical terms and concepts of the study that are chosen as a background for the discussion, underpin the author's understanding of education as something, which should be constructed and re-constructed on the basis of accompanying reflection. They are also an indication of the view that learning entails an inherent socio-cultural aspect.

This study does not address the entire model. It zooms in on the part of the model captured by the dotted line (Fig. 1):
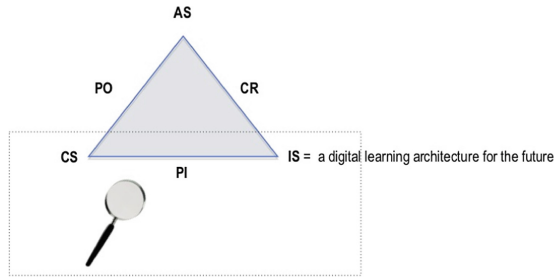
Fig. 1. A model for the development of learning designs (13:11)

"Pedagogical imagination may express a historical sensitivity acknowledging what has happened in education; an anthropoligical sensitivity, acknowledging what else has been done in education; and a critical sensitivity which means not taking the current situation as given." (13:13)

Along the lines of the study by Oestergaard [15], it aims to argue for the construction of a new innovative learning design model for professional and continuing education, which explores the rationale of pedagogical imagination (PI) as a pending process between the current situation (CS) and the envisioned conceptual model (IS).

3   Theoretical Perspective

This section gives an account of some of the main theoretical concepts, views and ideas involved in building up the discussion of the suggested digital architecture (Fig. 3) and its association with a view of "learning as negotiated identification" [1]. The idea is to generate a model for stimulating the creation of useful "prosumers" [6] of our social society. Through processes of negotiation and sharing of creative ideas and co-creating knowledge results to form citizens that potentially may be of value to other people and to society at large [16].

More concretely, the section will present and argue theoretically for the quality and virtues of the envisioned model through views on learning design characteristics that - from a theoretical perspective – invite an engaged learning behavior.

3.1   Agency and Communicative Initiative

Edwards and Mackenzie [17] introduced the concept of *relational agency*, resting on the idea of multivoicedness [17] and [18]. The term is further applies by Sorensen and Brooks [11], to understand online communicative behavior. They all agree that the term to denote "working alongside others toward negotiated outcomes". This invites another route of understanding for professionals who "are given significance through their ability to work independently" [19:61]. Each professional individual or team has a social language and its own way of representing reality. Therefore, collaborating and achieving a shared understanding requires a negotiation that "involves drawing on the resources of others and being a resource for others" [17:9].

According to Edwards [19] and [20], and further emphasized by Sorensen and Brooks [11], two aspects of collaboration come into play, when professionals work across different individuals or teams to negotiate a goal.

> The first is that each individual or team holds a specific expertise, and second, they combine both their core expertise and develop a *relational expertise*. This expertise stems from working across individual or team boundaries and is based on engaging with the knowledge of one's specialist practice as well as the ability to identify and respond to what others offer from their local systems of expertise [20:33].

In other words, boundaries create dialogic opportunities. Therefore, for relational agency to develop, an architecture for negotiation of diversity and collaborative meaning is inevitable, - that is, if collaborative learning and inclusive knowledge production across differences and professional borders are to be aimed for and facilitated.

3.2   Digital Dialogue and Collaborative Knowledge Construction

In the present perspective, "dialogue" is understood as a tool for negotiation of meaning, and *as a way of knowing*. A kind of epistemology [12], in which there are no fixed meanings to be learned. Meaning is always situated and expressed in a dialogic context, which is always open to new reflective and re-assessing comments. With reference to the insights of Bakhtin [18], Wegerif [20, 21] and Edwards (2011) takes this view to the extreme when concluding that there is neither a first nor a last word, and that there are no limits at all to the dialogic context, as it extends retrospectively into the "boundless past" and ahead into the "boundless future". In essence, the requirement for supporting *meta-communicative awareness* involves the wider concept of mutuality and relational agency, with significant implications for the design of learning.

For several decades Sorensen has worked with digital dialogues and co-creation of knowledge in online learning, (e.g. [4, 9, 11]). She argues that many virtual learning designs still fail, when unfolding in a virtual context, to let go on methodologies specifically inherited from face-to-face teaching/learning paradigms, many of which fail to stimulate learner-initiated democratic online interaction. This includes meta-interaction, a vehicle for supporting awareness, and it includes the birth of innovative learning. With the obtained insight and practical experience from many years of practical use and research studies, Sorensen and O´Murchú [4] presented a learning model for co-construction of knowledge *through learner dialogue and meta-learning* (Fig. 2).

The model (Fig. 2) produced the concept of "dialogic tapestries" and operates with a multimodal and very wide and diverse concept of resources [4], and the use of it continuously spawned new investigations, insights and resources. The latter may be of any kind of nature, ranging from traditional literature and readings of research papers, pieces of software, personal/mutual experience, and expert knowledge, to "meta-resources" like, e.g. previous dialogue and other plays of learning (Fig. 2). This wide resource concept adds to the openness of the model. Minimizing the determination of the script of the play of learning (the predicted frame of the future process), it leaves the actors with a freedom to establish ownership, to improvise, and thereby excerpt influence in a meaningful collaborative knowledge building (CKB) process (the actual situated unfolding process). In principle, any type of resource that enhances the CKB
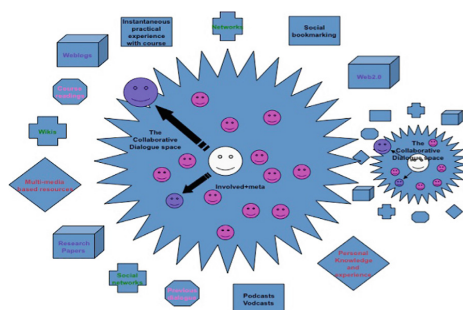
Fig. 2. Learning and collaborative knowledge building through online digital dialogue. Involved interaction (learners-learners and teachers-learners), and reflective meta-interaction (teacher-learners and learners-learners) [4:235].

process may be identified and pulled into the discussion and meta-discussions by the participants. Teacher and learner roles are equalled out and subverted dynamically. The strongest collaborative energy of a learning group manifests itself in the "Now" [4].

Through more than a decade, this model (Fig. 2) has been successfully implemented in practice contexts of Master programmes in higher education in both Denmark and Ireland[1].

Acknowledging the accumulated insights from both theory and practice on digital dialogues for learning of Sorensen [4], Wegerif [21], as well as the work of Darsoe [16] on innovation and learning designs for the emerging future, it makes sense to take these insights one step further and develop a learning architecture, which not only incorporates empowering learner dialogue and interaction, but actually puts an essential focus on the facilitation of *the collaborative and dialogic co-construction of NEW knowledge together with others*.

3.3   Open Educational Resources (OER)

The OER movement originated from developments in open and distance learning (ODL) and in the wider context of a culture of open[2] knowledge, open source, free sharing and peer collaboration, which emerged in the late 20th century[3]. A too tight definition of OER would exclude a large numbers of content representations that may still have been perceived, and/or used as OER.

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[1] The model has generated not only extensive data through educational practice (see e.g. Sorensen and Brooks [11], but has over the years also given birth to several scientific papers, the latest being Sorensen and Brooks [9]. Moreover, further research has explored digital learning dialogues, using Wittgenstein's Language Game theory [4].

[2] The word "open" has physical, psychological, narrative, and moral or value related implications. Openness also refers to various states of mind, including not having a secret agenda; being open to more angles, methods or theories; willingness to accept more than one possible conclusion and so forth. In respect of OER there is no doubt of the "Open" term meaning "free").

[3] Wikipedia: https://en.wikipedia.org/wiki/Open_educational_resources#cite_note-expert-meeting-17.

"Open" implies the idea of inclusiveness and that the content is completely accessible, easy to find, visible for the public and useful for somebody. The content can eventually be changed or reconfigured by the user(s). OER information and/or tasks can stand alone - that is to say, content which has been made for one context may potentially be used in a new context.

"Educational" suggests that one can learn something new at a qualitative formal level, which is different from knowledge sharing, peer-to-peer learning, or apprenticeship learning, implying that education is something that happens when one or more educated persons (with formal qualifications on a subject) teach their knowledge or skills on the subject. OER then refers to content that is formally qualified, and the content is meant as a possible help for learning the subject or topic in question. This content may be purely informational, training or exercises, self-tests or simulations, or it may be combinations of two or more of the above.

OERs may be viewed in a knowledge generating perspective in relation to learners recitation, knowledge sharing, knowledge selection, knowledge arrangement and, not least, meaning-making. But more importantly in relation to learning as a construction process and resources for knowledge sharing, see Harlung [5].

Learners may thus be characterized as both *consumers* of knowledge and *producers* of knowledge, the so-called "prosumers" [6]. These prosumers may thus incorporate OERs in order to produce new knowledge, but may also be seen as innovative producers of OERs. From this point of view there is an expectation to learners in professional and continuing education to learn something, to learn-to-learn [23], to produce something new, and implement the new" in their professional practices.

In a learning architecture for a sustainable future it makes sense to incorporate mechanisms of "openness", not only in terms of access to resources of all kinds, but also when we are aiming at a sustainable and yet innovative learning architecture prepared for the unforeseen future:

- Openness to the new. When learning processes are unpredictable it is not possible to know in advance which resources are relevant. This means that access to open and flexible learning resources is necessary in other to create, participate and reify the learning process.
- Openness in relation to the surrounding society, with a possibility for engaging in actual authentic dialogue and in order to align set of values and strategies.
- Openness in order to continuously be in contact with various human networks.
- Openness provides opportunity for timing and intervention.
- Openness within and outside the formal learning community invites inter- and transdisciplinarity.

Summing up, the author has argued for the importance of the three areas elucidated, "agency and communicative initiative", "digital dialogue and collaborative knowledge construction", and "open educational resources". They are all pertinent ingredients, of a learning design model and architecture in an innovative professional and continuing education design context. The model that the author proposes, incorporates the idea of "being innovative in relation to the future, while moving into the future". The model is outlined and presented in the next section.

4 A Sustainable Empowering Democratic Learning Architecture for the Future (SLAF)

The envisioned SLAF learning and negotiation model (Fig. 3) integrates the successful netbased dialogical model for collaborative knowledge building from Fig. 2. SLAF then becomes a communicative melting pot, in which all stakeholders – across hierarchical positions and disciplines - in a "modus 2" setting [3] participate, create and innovate in a collaborative knowledge building process without walls. All participants (including researchers) are both contributors (provide input) and learners (gaining output). Everyone involved (i.e. perspectives and areas of the various knowledge areas represented), may be characterized as "prosumers" [6]. All stakeholders from the four main areas of society (Fig. 3) contribute as *input* their insights and expertise to the collaborative work and negotiated identification/learning process, and likewise every stakeholder takes away, as *output* from the collaborative learning and negotiation process, exactly that which makes sense to him/her and is useful from his/her individual position and perspective. In the wording of Edwards [24]:
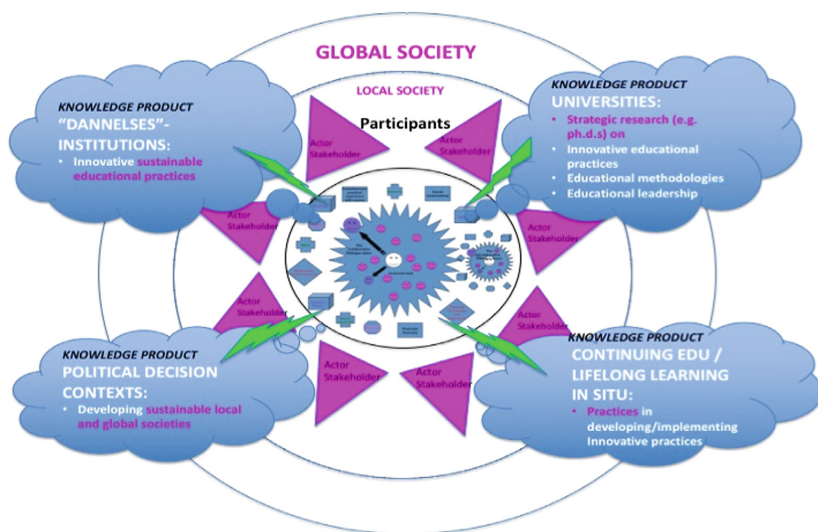

Fig. 3. The SLAF model. Innovative learning and collaborative knowledge building across positions and disciplines. Innovation and data generation in situ.

(…) boundaries as spaces where the resources from different practices are brought together to expand interpretations of multifaceted tasks, and not as barriers between the knowledge and motives that characterize specialist practices. Importantly, the learning that occurs in these spaces is not a matter of learning how to do the work of others, but involves gaining sufficient insight into purposes and practices of others to enable collaboration [25:34]

5   Conclusion

This paper has addressed the challenge of establishing a networked learning design or architecture appropriate for the sustained design of both continuing and professional education. Bringing in theoretical concepts, together with the affordances of digital technologies, and using an action research methodology of critical research in a meta-perspective [13], the paper has attempted to elucidate the type of considerations and discussions needed as a prerequisite for forming a general concept/model for pedagogic design for professional and continuing education.

In a wider perspective the architecture may serve as a model for associating education with research in a way that ensure research-based teaching and learning. The two contexts share the same need for being able to work in environments for connecting and engaging in dialogue and collaboration across diverse professional contexts. This invites the interactive, inter-connective, collaborative, and reflective potential of digital technology – for creating the social networks (open to the data, processes and products of the future) and for reifying a genuine innovative collaborative process, suited and sustained for the unknown future.

Acknowledging that dialogic teaching tends to draw learners into an epistemological process of shared knowledge construction, this means that the primary objective in a context of digital collaborative knowledge building dialogue must be to engage participants in sustained stretches of talk [20]. Doing so enables speakers and listeners (participants) to explore and build on their own and others' ideas – in the course of, not re-producing, but collaboratively holding different ideas together in the tension of a dialogue, while producing NEW insight - and potentially, through this ontological focus, change our reality.

References

1. Oestergaard, R., Sorensen, E.K.: Networked learning as a process of identification in the intersection of collaborative knowledge building. Fostering creativity, awareness and re-use of OER. In: Proceedings of the European Conference for Open and Distance E-Learning, EDEN 2011, held at the University College Dublin (UCD), 19–22 June 2011, pp. 22–26 (2011)
2. Conole, G.: Designing for learning in an Open World. Springer, New York (2013). https://doi.org/10.1007/978-1-4419-8517-0
3. Nowotny, H.: Cultures of Technology and the Quest for Innovation. Berghahn Books, New York (2006). ISBN 9781845451172
4. Sorensen, E.K., O'Murchú, D.: Identifying an appropriate, pedagogical, networked architecture for online learning communities within higher and continuing education. In: Sorensen, E.K., O'Murchú, D. (eds.) Enhancing Learning Through Technology, pp. 226–251. Idea Group Inc., Hershey (2006)
5. Harlung, A.H.: Open Educational Resources in Denmark. Status report 2010, Center for IT and Learning, Aarhus University, Denmark (2010)
6. Helms, N.H., Agerbæk, L.: Nettets læringstopografi. Et anslag til didaktisk kortlægning af metaverse, i Onedge 2_10, Knowledge Lab, University of Southern Denmark (2010)
7. Dalsgaard, C., Sorensen, E.K.: A typology for Web 2.0, pp. 272–279. ECEL (2008)

8. Dalsgaard, C.N.: Internettet som personaliseret og social medie. Læring & Medier (LOM) **3** (5) (2010). ISSN: 1903-248X

9. Sorensen, E.K., Brooks, E.I.: Promoting agency and identity building in dialogic learning communities online. Submitted for the Networked Learning conference to be held in Zagreb, Croatia, 14–16 May 2018 (2018)

10. Andersen, H.V., Sorensen, E.K., De Lopez, K.J., Jensen, R.H.S. (eds.): It-baseret inklusion af elever med udviklings- og opmærksomhedsproblemer i folkeskolen. Aalborg:Aalborg Universitetsforlag, 194 p. (2017)

11. Sorensen, E.K., Brooks, E.I.: Designing Inclusive Reflective Learning with Digital Democratic Dialogue Across Boundaries and Diversities. Published in the Proceedings of the Design, Learning and Innovation (DLI) Conference, held in Heraklion, Crete, Greece, 30–31 October 2017 (2017)

12. Sorensen, E. K (2008). Design of dialogic eLearning-to-learn: metalearning as pedagogical methodology. Int. J. Web Based Communities **4**(2), 244–252 (2008)

13. Skovsmose, O., Borba, B.: Research Methodology and Critical Mathematics Education. Res. Socio-Polit. Dimens. Math. Educ.: Issues Power Theory Methodol. **2004**, 207–226 (2004)

14. Barab, S., Squire, K.: Design based research: putting a stake in the ground. J. Learn. Sci. **13** (1), 1–14 (2004)

15. Østergaard, R.: Master thesis: Professionsuddannelse i et fremtidsperspektiv, p. 2004. Aalborg Universitet, Brobygning mellem teori og praksis i fysioterapeutuddannelsen (2004)

16. Darsø, L.: Innovationspædagogik: kunsten at fremelske innovationskompetence. Samfundslitteratur, Frederiksberg (2011)

17. Edwards, A., Mackenzie, L.: Steps towards participation: the social support of learning trajectories. Int. J. Lifelong Educ. **24**(4), 287–302 (2005)

18. Bakhtin, M.M.: Speech Genres and Other Late Essays. University of Texas, Austin (1986)

19. Edwards, A.: Being an Expert Practitioner: The Relational Turn in Expertise. Springer, London (2010)

20. Edwards, A.: Building common knowledge at the boundaries between professional practices: relational agency and relational expertise in systems of distributed expertise. Int. J. Educ. Res. **50**, 33–39 (2011)

21. Wegerif, R.: Dialogic education: what is it and why do we need it? Educ. Rev. **19**(2), 58–67 (2006)

22. Wegerif, R.: Applying dialogic theory to illuminate the relationship between literacy education and teaching thinking in the context of the Internet Age. Contribution to a special issue on International Perspectives on Dialogic Theory and Practice, edited by Sue Brindley, Mary Juzwik, and Alison Whitehurst. L1-Educational Studies in Language and Literature, 16, p. 1–21 (2016). http://dx.doi.org/10.17239/L1ESLL-2016.16.02.07

23. Bateson, G.: Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution, and Epistemology. University of Chicago Press, Chicago (1976)

24. Edwards, A.: Relational agency in professional practice: a CHAT analysis. An Int. J. Hum. Act. Theory **1**, 1–17 (2007)

25. Edwards, A.: Cultural Historical Activity Theory and Learning: a relational turn. TLRP Annual Conference Keynote Address, University of Warwick (2005)