A first attempt in shaping learning communities for the energy transition

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Abstract. Learning communities (LCs) can be seen as an promising concept to shape professional development and thereby enhance innovation for the energy transition. However, as the design of an LC is dependent on the needs of the participating organizations and the problems they want to solve, no general blue prints are available for shaping an LC. Therefore, this study aims to find an answer to the question: *How should LCs for the energy transition be designed to support participants' professional development and stimulate innovation?* First, a literature study and needs assessment was conducted at eight SMEs in the installation sector, which led to an LC prototype. The LC prototype was then tested in four different SME's which eventually provided an LC prototype for the installation sector that stimulates professional development and innovation.

Keywords. Learning communities, installation sector, energy transition, professional development.
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1. Introduction

The energy transition is leading to significant changes in the work of installation technology professionals. These changes call for new technologies and sustainable energy sources, which requires continuous professional development [1,2]. This is one of the reasons that the Dutch installation sector embraced the concept of learning communities (LCs) to support the professional development of employees [3]. LCs refer to public-private partnerships in which learning, working and innovating come together in hybrid learning environments [3,4]. They are a powerful alternative to formal training programmes, which are often expensive, ineffective and unattractive for keeping up with the energy transition [5]. On the other hand, informal learning activities in the workplace are often too fragmented and unsupported [6]. To date, LCs are seen as promising to increase innovation [4,7]. However, designing LCs still needs attention. Evidence of how an LC can contribute to professional development and stimulate innovation is lacking [8,3]. Therefore, this paper aims to find an answer on the question: *How should LCs for the energy transition be designed to support participants' professional development and stimulate innovation?*

1.1 Theoretical framework

Although the term LC is frequently used, there is no universal definition of an LC. This is due to a variety in, for example, group size, subject and duration [9]. Nevertheless, the Topsectoren identified some key characteristics of an LC, based on extensive field consultation: LCs are (1) designed as a public-private partnership; (2) accessible to employees and students and employees of (higher) vocational education and training institutions; (3) focused on return on investment for all parties involved; (4) combining physical and virtual (learning) environments; (5) focused on connecting research, working, learning and innovation. Participants in a LC work together collectively on a meaningful challenge to build on already existing knowledge, and thus learn at the individual and group level [10,11]. However, this definition is more a description on what an LC is, than a description of how it works. Therefore, this study explored literature on professional learning, team learning, and work design to come up with important mechanisms that an LC needs to support. Subsequently, an effective LC should be based on the following principles: collaboration, the integration in daily work practice and the integration of formal and

informal learning, all of which are further discussed below.

1.2 Learning in an LC is a shared process

Interdisciplinary collaboration is important as it generates a deeper level of knowledge of different subjects and each other's expertise, increases critical thinking and initiative taking and develops a common purpose [12,13,14]. Sharing knowledge starts with the creation of shared goals, a shared identity that encourages engagement or a shared language that improves mutual understanding [15]. Palloff and Pratt[16] state that working towards a shared goal is not only the first step towards collaboration, but also the basis for an LC. If it is clear in advance that the participants are working towards a common goal, it is also easier for participants to engage in collaborative tasks [16,17]. By linking common learning goals to societal needs - such as the energy transition - LC participants are challenged to immerse themselves in new knowledge, integrate it with practice, reflect critically on themselves, solve problems creatively, collaborate, and understand the complex causes of societal problems [18]. When working towards a common learning goal, individual learning goals can also arise [19].

1.3 Learning and working is situated and integrated in daily practice

The LC is organised directly in, or next to, the working practice of participants, which requires a learning environment in which certain requirements are met. Complexities in work stimulate learning, initiative-taking, creativity, and problem-solving skills [20], but it also requires a context that offers room for autonomy [21]. Participants should be given the space to work on and come up with suitable tasks, both outside and within the LC. Therefore, both formal and informal learning activities should be set up [22]. This depends on the implicit ('know-how') and/or explicit knowledge ('know-that') of the LCs participants. This can be experimenting with new products, materials and services; reflecting on one's own work performance; looking up information; observing or attending presentations. The activities can take place at the physical workplace, in collaboration with colleagues or students or in contact with clients. The choice for a particular learning activity depends on the LCs learning goal [6]. The learning goal is linked to daily practice, as it is designed around a current, innovative issue. In that way, the LC and learning activities are situated and integrated in daily practice.

1.4 Learning in an LC is self-directed, but also guided

An important motor for professional learning is self-directedness. Participants learn if they experience certain challenges; performing motivating tasks, tasks that give a certain amount of uncertainty or risk [23]. By reflecting on one's own contribution to work experiences, uncertainties and success, participants will increasingly steer their own learning process, which will lead to self-monitoring and self-directed learning [24,25,26]. This is an ongoing process, in which actions are aimed at achieving goals. These goals are chosen and aligned with one's own vision [25,27]. In the LC, this means that both the LC as a whole, and the individual participants set their own goals, select necessary learning activities and evaluate [28].

Since self-directed learning does not automatically occur, a facilitator should be appointed to guide the process [27,29]. Literature also shows the importance of a facilitator in the creation of a safe learning climate, in which they can address important, but undiscussed, issues (e.g., values within the LC and mutual relationships) [30,31,32]. In addition, they can support and monitor the design process [33]. Also, participants need support in the transfer of what has been learned in the LC to daily working practice. A facilitator should coach participants in setting goals, practising new tasks and giving (individual) feedback [34]. Scaffolding is a way to support learning, which is the provision of support by, for example, asking questions, eliciting certain behaviour and modelling, which is adapted to the needs and progress of the participants and gradually fades away [35]. This increases the participants' self-confidence and sense of competence, which are important conditions for learning [35,36,37].

Following, the study examines whether the aforementioned conditions are present in the technical companies' current day-to-day practice, which is used to make the LC prototype suitable for their context.

2. Research methods

2.1 Method

This exploratory study has used a design research approach to arrive at three prerequisites for an LC prototype, which includes three iterative, flexible phases [38]. Figure 1 shows these different phases and used methods, corresponding the design research approach by McKenney and Reeves[41]. The

phases have been undertaken sequentially such that the findings from each phase will inform the next phase, and the final phase will involve reviewing the findings from phase two to confirm or modify the prerequisites for the prototype.

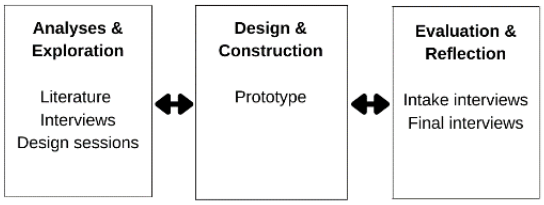

Fig. 1 – Research methods in a design research approach.

This research first looked at how LCs should be designed in the installation sector (literature and needs assessment through interviews and design sessions). In the second phase, the prerequisites resulting from the needs assessment were translated into an LC prototype. The prototype was tested and evaluated through intake and final interviews with participants during pilot studies. Goals of all measurements instruments are shown in Table 1.

Tab. 1 – Measurement instruments.

Phase	Instrument	Goal
Analyse	Interviews	Explore participants' perceptions of an LC and align prerequisites with the target group.
	Design sessions	Concretise the initial prerequisites and modify them to suit the context.
Design	Prototype	
Evaluate	Intake interviews	Establish a baseline; gauge expectations and current working methods.
	Observations	Observe whether the form of the LC is also carried out as described in the prerequisites, and whether this fits with the employees.
	Final interviews	Explore participants' opinions and experiences regarding (design of an) LC and the impact the LC has had on their daily work practice.

2.2 Respondents

Within all phases, the participants were employees of four installation companies. The participating installation companies were selected based on the following criteria: (1) small and medium-sized enterprises, (< 500 employees); (2) located in the Eastern part of the Netherlands; (3) active with energy transition-related innovations. In addition, teachers from four educational institutions participated in the study. The participating educational institutions consist of a post-secondary vocational education (ROC van Twente), two universities of applied sciences (Saxion and Windesheim Universities of Applied Sciences) and one university (University of Twente).

2.2 Phase 1: Analyses and exploration

Eight in-depth interviews were held with managers and employees with a leadership role, and six interviews with training coordinators and lecturers from two educational institutions. During the interviews, 1) the short- and long-term challenges in work and the energy transition, 2) reason(s) for participating in an LC and 3) expectations of the design were discussed.

Based on the outcomes of the exploratory interviews and the literature study, two LC design sessions were held to supplement the theoretically formatted principles with requirements for practical usability. This was done in the two sessions, one with directors and managers, and one with mechanics and operational staff. The participants worked together in groups of four with lecturers from educational institutions, under the guidance of a researcher, to complete a worksheet. The accompanying researcher ensured that every participant gave input from their own experiences, and that the considerations and answers were correctly noted on the worksheet. The complemented worksheets contained information about 1) appropriate LC goals, 2) suitable participants that can participate in the LC based on the LC goals, 3) required resources and/or learning activities, 4) possible presence of experts and 5) which preconditions are needed for the LC to succeed. Eventually, the researchers shared results between the two groups to reach consensus about the prerequisites.

Data analyses

The interviews were recorded, transcribed and then coded according to the previously mentioned topics of the in-depth interviews; 1) the short- and long-term challenges in work and the energy transition, 2) reason(s) for participating in an LC and 3)

Tab. 2 – Prerequisites resulting from the first phase.

Prerequisites	Substantive points
Learning in an LC is a shared process	- A shared purpose, task interdependence and joint responsibility for the final product creates team learning. - Participants have complementary expertise, which is made explicit and respected. - The three main facilitating team learning processes are supported by a facilitator (team activity, team reflexivity, boundary crossing). - Team learning is connected to individual learning. - The collaborative process is socially regulated - LC has a clear identity, participants feel connected to the group, and can identify with it (connectedness).
Learning and working in an LC is situated and integrated in daily practice.	- Learning outcomes are relevant and can be applied in work - The issue of the LC is within the domain of influence of the participants. - The issue of the LC is possible to address in the chosen time frame. - Learning activities are designed in line with work - The learning outcomes are integrated into the daily actions of employees and managers. At the organisational level, the learning outcomes are integrated into the 'way-of working' (way of scheduling jobs, evaluation strategies, stimulating knowledge sharing, etc.). - Working through LCs is integrated into the way of working of the company.
Learning in an LC is self-directed, but guided	- An agile rather than traditional plan-based system is used. - The individual process is self-directed, possibly through co-regulation. - Support and tools are developed, for both the collaborative and individual processes, according to principles of scaffolding - Participants have a say in designing work and learning goal(s) and how to reach them (autonomy, self-direction). - Participants feel confident (self efficacy / team efficacy) and competent, both through the support of the organisation and through the facilitation offered.

expectations of the design were discussed. These answers were then compared to each other in order to arrive at prerequisites (Table 2).

2.3 Phase 2: Design and construction

An LC prototype was designed on the basis of the prerequisites (Table 2) and shown in Table 3.

Subsequently, four LCs at four different companies were implemented based on the prototype. These LCs were held between December 2020 to October 2021 and supervised by an external facilitator. For each LC, one researcher was directly involved during the intake and final interviews, and at all LC meetings as a direct observer.

2.4 Phase 3: Evaluation and reflection

In order to confirm or modify the LC prototype, intake and final interviews were held with the participants to access the prerequisites. The meetings were also directly observed by a researcher to receive more information on the prerequisites.

The facilitator and researcher conducted intake interviews among all LC participants (N=36) before the LC sessions started. The intake interviews took

Tab. 3 – Connection prerequisites to prototype.

Prerequisites	In prototype
Learning in an LC is a shared process	Participants from different parts of the organisation are brought together around the intended goal. Everyone participates to find an answer to the common problem
Learning and working is situated and integrated with daily practice.	The LC is formed around a concrete, practical and innovative issue that is relevant to all participants and addressed in ten weekly meetings. During, and between, the meetings, different types of learning activities are undertaken, formal (presentation) and informal in the workplace (watching someone). This depends on the purpose of the LC.
Learning in an LC is self-directed, but guided	All participants set individual learning goals at the beginning of the LC, linked to the common goal. The LC is supervised by an external facilitator who facilitates the learning process at both the individual and team level.

approximately 45 minutes and asked the participants about background information, current work activities, their experience with the LC topic, expectations of the LC and preferences for learning and collaboration during work.

All LC meetings (N=35) were recorded and observed by a researcher using an observation scheme. This schedule was based on the established LC prerequisites. The observations looked at how, and if, the corresponding behaviours were visible during the LC meetings.

The same participants (N=36) were invited to final interviews after all the LC meetings to discuss 1) their experiences of the LC results, 2) the content and (learning) activities during and between the LC meetings, 3) the experienced effects of the LC in their own daily work practice, 4) the collaboration and knowledge sharing (among themselves) with the participants, and 5) the role of the facilitator during the LC. The facilitators (N=3) were asked about the 1) the interpretation of the prerequisites in the LC and how they steered this as facilitators, 2) their role as facilitators in stimulating knowledge sharing and collaboration between the participants, and 3) other remarks concerning the LC meetings and points of attention for follow-up.

Data analyses
The researchers made summaries of all intake and final interviews and observations. These summaries were used in debrief sessions, in which similarities and differences were explored and debated by two researchers.

3. Results

The first phase resulted in prerequisites, which were then translated into a prototype (Table 3). Finally, the prototype was tested in the third phase.

Prerequisite 1: Learning in an LC is a shared process.
The LC consisted of participants with different backgrounds and perspectives. Therefore, participants needed to share their expertise and knowledge explicitly, so that everybody understood each other. The facilitator enhanced this collective process by asking questions and connecting all individual perspectives to the collective goal. This made the participants feel connected to the group. However, the feeling of belonging reduced when the LC finished or the link between the LC theme and participants' daily working practice diminished (because of differences in individual goals or a change in job activities). As a result, participants were more inclined to become absent or did not actively participate during the meetings. All LCs started with a kick-off meeting to discuss the collective goal and the individual contributions. If these goals were clear in the beginning, the subsequent meetings also proceeded more easily.
This is also important, as participants found it difficult to define their individual learning goal. They found it hard to come up with things they wanted to 'learn'. Using language that matches the language used by the participants in the workplace (e.g., what are your struggles while working with X), stimulated participants to come up with suggestions and ideas for learning goals.

Prerequisite 2: Learning and working is situated and integrated in daily practice.
Participants felt connected and that they added value to the learning process if the collective goal/LC issue was relevant to their daily work practice. The LC issue needed to be closely linked to their own work activities and participants needed to be able to implement the outcomes of the LC directly into participants' work. For example, one LC was built around the issue of working with a digital, technical programme, which was not directly relevant to all participants' daily work practice. Participants became distant and cancelled the meetings.

The learning activities during the LC consisted of trying out a certain object, experimenting with technology in practice, or looking up information. The facilitator supported the participants to transform their ideas into learning activities. Participants indicated that carrying out tasks that take up a lot of time outside of meetings and which are not directly linked to their work activities, is not desirable, mainly due to increased work pressure.

Prerequisite 3: Learning in an LC is self-directed, but guided.
The participants often had a wait-and-see attitude when starting the LC, because they had never experienced such a way of learning and working before.
During the meetings, it was experienced as pleasant that the facilitator explored and showed the (learning) benefits of the meetings, because the participants indicated to be less aware of this.
Reflecting on, and evaluating, one's own contribution to work experiences, the uncertainties and successes, strengthens learning and self-directed learning. The facilitator is very decisive in the extent to which, and how, this happens.
The facilitator has no substantive knowledge of the subject, which is experienced as pleasant by the

participants, as they become induced to explain and argue everything. The facilitator helps to make implicit knowledge explicit by asking questions and making the results visible during the process. He/she is also important for creating a safe learning climate, and discusses issues that are somewhat more below the surface.

4. Discussion

The aim of this paper was to create an applicable model for LCs in the installation industry, by establishing prerequisites. These conditions were constructed into a prototype, which was then tested and evaluated in four pilot studies.

1. Participants will only demonstrate learning behaviour if they are given the room to make mistakes outside of the meetings and feel trusted by the organisation.

LC participants only share knowledge, evaluate and combine different perspectives and knowledge if they feel that they are allowed to do so [30,39]. Such psychological safe environment is important in and outside the LC meetings to enhance team learning behaviour (e.g., share knowledge, evaluate, combine different perspectives). A psychologically safe environment during the LC meetings does not guarantee that participants will show team learning behaviour outside the LC meetings. This research even shows that if the participants feel as if they can't make mistakes, this will influence their contribution to the LC meetings, because they are more reluctant in sharing knowledge and trying out new things.

2. Participants are more motivated to actively share their knowledge and skills during the meetings when the LC topic has a direct connection to participants' daily work

For participants to actively exchange knowledge and skills, they must be motivated to join the LC meetings. Therefore, it is important to align the (joint and individual) goals with participants' daily work practice. At least three meetings are necessary to align these goals. During those three meetings, the learning objectives can be tailored to the participants. As a result, participants come up with more practical examples that they can share with each other. Furthermore, a facilitator is needed to guide and support this process extensively [41], as participants find it difficult to do this themselves.

3. More than guidance and setting individual learning goals is needed to stimulate self-directed learning.

In line with research [26], participants find it hard to direct their learning, as 'learning' as a phenomenon is hard to understand and define. Therefore, different use of language to explain learning and intensive support from a facilitator is needed [27,41]. A facilitator should stimulate reflection during the meetings, by ensuring that the content is in line with the collective and individual goal and ask questions about the presented knowledge. The facilitator has no knowledge of the issue that is being raised, which makes the facilitator question the knowledge being shared [41]. Participants then share more knowledge and implicit knowledge is made explicit. In that way, the facilitator can steer self-directed learning.

4.1 Limitations and further research

As mentioned before, the facilitator is a crucial factor during the LC meetings. However, every facilitator has its own way of guidance, which results in LCs being facilitated differently every time. This affects LC outcomes. Further research should create a baseline for guidance by developing training for facilitators.

As this was a first attempt in shaping LCs for the energy transition, the prerequisites were only tested in four LCs. To receive more detailed results, further research should test the prerequisites and corresponding prototype more extensive in multiple LCs.

4.2 Practical implications

This research shows how LCs for the energy transition can be designed. Some implications for companies can be given to stimulate innovation among technical employees.

1. LCs are a promising concept for lifelong learning around the changes resulting from the energy transition. Through participation in LCs, employees can be trained on the job and during current work activities. This can be a solution to the labour shortage in SMEs.
2. Companies should stimulate innovation and professional development by creating a psychological safe environment [33]. In such context it is in allowed to make mistakes and employees feel trusted and respected.
3. Companies should implement the LC to stimulate professional development around innovation. As the role of a facilitator is important, companies should look at HR as a possible facilitator. He/she stands apart from the LC subject and has knowledge of professional development.
3. Organise LCs around a concrete project or challenge within the company. Make sure that the participants of the LC are also closely involved in this

project or challenge, so that they can immediately implement the knowledge from the meetings in their daily work.
4. Ask employees how they develop their knowledge and skills in their daily work practice. Make sure that the LC is connected to this.

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The datasets generated during and/or analysed during the current study are not available because follow-up research is ongoing, so the data is still being used. The authors will make every reasonable effort to publish them in near future.

6. References

1. Eilander M. De techniekprofessional en de energietransitie. Installatiejournaal. [internet] 2019. [cited 2020 Jun 1]. Available from https://www.installatiejournaal.nl/energie/nieuws/2019/08/de-techniekprofessional-en-de-energietransitie-1019926?_ga=2.143906802.695365027.1591867052-1224732855.15918670

2.Noorman KJ. Over Energiestransitie en nog zoveel meer. Groningen (NL): Hanze University of Applied Sciences; 2018.

3. Topsectoren. Advies Meerjarig Onderzoeksprogramma Learning Communities. [internet] 2019. [cited 2020 june]. Available from https://www.topsectorenergie.nl/sites/default/files/uploads/Algemeen/Advies meerjarig onderzoeksprogramma Learning Communities.pdf

4. Dingyloudi F, & Strijbos JW. Community Representations in Learning Communities. Scandinavian Journal of Educational Research. 2019;64(7):1052-1070. Available from: doi: 10.1080/00313831.2019.1640788

5. Bersin J. A new paradigm for corporate training: Learning in the flow of work. [internet] 2018. [cited 2020 Jun]. Available from https://joshbersin.com/2018/06/a-new-paradigm-for-corporate-training-learning-in-the-flow-of-work/

6. Eraut M. Non-formal learning and tacit knowledge in professional work. British Journal of Educational Psychology. 2000;70:113–136. Available from: http://www.ingentaconnect.com/content/bpsoc/bjep/2000/00000070/00000001/art00008

7. Gebauer R, Wade ME, Muller T, Kramer S, Leary M, & Sopper J. Unique Strategies to Foster Integrative Learning in Residential Learning Communities. Learning Communities Research and Practice. 2020;8(1).

8. Ke F, & Hoadley C. Evaluating online learning communities. Educational Technology Research and Development. 2009;57(4):487–510. Available from doi:10.1007/s11423-009-9120-2

9. Knol E, & Velzing E. Learning communities voor MMIP ' s : een schakel voor versnelling en opschaling. Verkenning op verzoek Topsector Energie en in opdracht van RVO. 2019. Available from doi:10.13140/RG.2.2.24965.81128

10. Blackshaw T. Key concepts in community studies. Thousand Ouks (US): Sage; 2010.

11. Scardamalia M, & Bereiter C. Computer Support for Knowledge-Building Communities. The journal of learning sciences. 1994;3:265-283. Available from doi:10.1207/s15327809jls0303_3

12. Brookfield SD. Becoming a critically reflective teacher. San Francisco (US): Jossey-Bass; 2017.

13. Edmondson AC, Dillon JR, & Roloff KS. 6 Three Perspectives on Team Learning. The Academy of Management Annals. 2017;1P:269-314. Available from doi: 10.1080/078559811

14. Kilpatrick S, Jones T, & Barrett M. Defining learning communities. Launceston (Tasmania): Centre for Research and Learning in Regional Australia; 2003.

15. Vollenbroek WB. Communities of Practice: Beyond the Hype: Analysing the Developments in Communities of Practice at Work. Enschede (NL): University of Twente; 2019.

16. Palloff RM, & Pratt K. Collaborating online: Learning together in community. New York (US): John Wiley & Sons; 2010.

17. Hord SM. Professional learning communities. Journal of staff development. 2009;30(1):40-43.

18. Jacoby B. Partnerships for service learning. New Directions for student services. 1999;(87):19-35.

19. Janssen S, Jansen F, Schaepkens H, & De Groot M. Van teamontwikkeling naar persoonlijke ontwikkeling en omgekeerd. Amsterdam (NL): Open Universiteit; 2011.

20. Chae H, & Choi JN. Contextualizing the effects of job complexity on creativity and task performance: Extending job design theory with social and contextual contingencies. Journal of Occupational and Organizational Psychology.

2018;91(2):316–339. Available from doi:10.1111/joop.12204
21. Van Ruysseveldt J, & Van Dijke MH. Wanneer bevordert en wanneer hindert werkdruk het werkplekleren? Gedrag En Organisatie. 2012;25(1):28–44. Available from doi:10.5117/2012.025.001.028
22. Tynjälä P. Toward a 3-P Model of Workplace Learning: a Literature Review. Vocations and Learning. 2013;6:11–36. Available from doi:10.1007/s12186-012-9091-z
23. Preenen PTY, Van Vianen AEM, De Pater IE, & Geerling R. Ervaren Uitdaging op het Werk. Gedrag & Organisatie. 2011;24(1):64-83. Available from doi:10.5117/2011.024.001.064
24. Knowles M. Self-Directed Learning: A Guide for Learners and Teachers. Chicago Self-Directed Learning: A Guide for Learners and Teachers. Chicago (US): Follett Publishing Company; 1975.
25. Luken T. De (on)mogelijkheid van nieuw leren en zelfsturing. In Kuijpers M. & Meijers F, editors. Loopbaanleren: Onderzoek en praktijk in het onderwijs. Antwerpen (BE): Garant; 2008. p. 127-151.
26. Margaryan A, Littlejohn A, & Milligan C. Self-regulated learning in the workplace: Strategies and factors in the attainment of learning goals. International Journal of Training and Development. 2013;17(4):245–259. Available from doi:10.1111/ijtd.12013
27. Harms GJ. Zelfsturing meetbaar maken. Groningen (NL): University of Groningen; 2010.
28. Siadaty M, Gašević D, Jovanović J, Pata K., Milikić N, Holocher-Ertl T, Jeremić Z., Ali L, Giljanović A, & Hatala M. Self-regulated workplace learning: A pedagogical framework and semantic web-based environment. Educational Technology and Society. 2012;15(4):75–88.
29. Hmelo-Silver CE, Chinn CA, Chan CKK, & O'Donnell AM. (2013). The International Handbook of Collaborative Learning. New York (US): Routledge; 2013. Available from doi:10.4324/9780203837290
30. Edmondson AC. Psychological safety and learning behavior in work teams. Administrative Science Quarterly. 1999;44:350-383
31. Pereles L, Lockyer J, & Fidler, H. Permanent small groups: group dynamics learning and
change. Journal of Continuing Education in the Health Professions. 2002;22(4):205-13. doi: 10.1002/chp.1340220404.
32. Wenger E, McDermott R, & Snyder, W. Cultivating Communities of Practice. Massachusetts (US); Harvard Business School Press; 2002.
33. Becuwe H, Tondeur J, Pareja Roblin N, Thys J, & Castelein E. Teacher design teams as a strategy for professional development: the role of the facilitator. Educational Research and Evaluation. 2016;22(3–4):141–154. Available from doi:10.1080/13803611.2016.1247724
34. Dochy F, & Segers M. Creating Impact Through Future Learning. Londen (UK): Routledge; 2018.
35. Van de Pol J, Volman M, & Beishuizen J. Scaffolding in teacher-student interaction: A decade of research. Educational Psychology Review. 2010;22(3):271–296. Available from doi:10.1007/s10648-010-9127-6
36. Parker SK, & Wang Y. Helping people to 'make things happen': A framework for proactivity at work. International Coaching Psychology Review. International Coaching Psychology Review. 2015;10(1):62-75.
37. Ryan RM, & Deci EL. Self-Determination Theory. New York (US): The Guilford Press; 2017.
38. McKenney S, & Reeves TC. Conducting Educational Design Research. New York (US): Routledge; 2019.
39. Van Veelen R, & Ufkes EG. Teaming Up or Down? A Multisource Study on the Role of Team Identification and Learning in the Team Diversity–Performance Link. Group and Organization Management. 2019;44(1):38-71. Available from doi:10.1177/1059601117750532
40. West RE, & Williams GS. "I don't think that word means what you think it means": A proposed framework for defining learning communities. Educational Technology Research and Development. 2017;65:1569–1582. Available from doi:10.1007/s11423-017-9535-0
41. Sessums C. Learning Communities and Support; transformation framework. Redmond (US): Microsoft Corporation; 2014.