Workplaces as learning environments

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• Review on Guidance in VET
  Mikkonen, S., Pylväs, L., Rintala, H., Nokelainen, P., & Postareff, L. (2017). Guiding workplace learning in vocational education and training: A literature review. *Empirical Research in Vocational Education and Training*.

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Introduction

• Interest in workplace learning has grown in recent decades due to the changing character of work and the acknowledgement of the workplace as a learning environment (e.g. Fuller and Unwin 2003, 2011; Illeris 2003).

• In the context of vocational education and training (VET), apprenticeships and work-based learning have been promoted (e.g., European Commission 2015).

• The aim of this review is to provide an overview of guidance and learning at the workplace in the context of vocational education and training.
Workplace learning

• In the field of workplace learning, sociocultural theories consider learning as an ongoing, both an individual and social process of participation shaped by social, organizational, cultural and other contextual factors (Hager 2013).

• Tynjälä’s (2013) 3-P model of workplace learning acknowledges the sociocultural environment as a context that defines the possibilities and constraints of workplace learning.
Workplace learning

SOCIOCULTURAL ENVIRONMENT
- Models of work experience - Communities of practice - Organisational learning

Presage

Learner factors
- prior knowledge & experience
- ability
- agency & commitment
- motivation
- self-confidence
- life situations

Learning context
- organizational structure
- organization of work
- human resource development
- expertise of staff
- manager support
- collaborative climate
- orientation towards learning and innovations
- partnerships & networks

Process

Activities
- Unintentional / intentional informal / nonformal / formal learning through
  - doing the job itself
  - reflecting and evaluating one's own work experiences
  - collaborating and interacting with other people
  - participating in networks
  - tackling new challenges and tasks
  - participating in formal training

Interpretation e.g.
“My skills help me ascend at work”

“Work climate is poor in our firm”

Product

Learning outcomes
- task performance
- understanding
- personal development
- team work
- role performance
- academic knowledge & skills
- decision making & problem solving

- creative solutions
- identity
- agency

- bad work practices
- organizational development
- improved quality
- improved productivity
- improved work climate

SOCIOCULTURAL ENVIRONMENT
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(Tynjälä, 2013.)
Workplace learning

- Workplace learning is often considered incidental or informal, even if it could instead be seen as non-formal with different levels of intention to learn, including implicit, reactive and deliberate learning (Eraut 2004).
- Alternatively, one can regard all learning experiences as intentional because they aim at ensuring the continuity of social and work practices (Billett 2002b).
- Ethnographic field studies on apprenticeships by Lave and Wenger (1991) suggest that learning happens in everyday interactions and through participation in communities of practice.
Workplace learning

- The theory by Lave and Wenger (1991) has been criticized as it neglects guidance and formal education, and is based on the idea that skills, knowledges and practices are passed on to novices.
- By doing this, the theory ignores the reciprocity of learning and the continuation of learning even after a full membership in a community of practice has been obtained (Fuller, Hodkinson, H., Hodkinson, P., and Unwin, 2005).
Guidance

• Term *guidance* (instead of coaching, tutoring and mentoring) is used here to describe the support that members of the work community and teachers from vocational institutes provide for students.

• We also utilize Billett’s (2002b) division of *indirect* and *direct guidance* to describe various guidance practices at the workplace.
Guidance

- *Workplace pedagogic practices* (Billett 2002b) comprise three interdependent planes of guided engagement with work activities
  1. Access to knowledge, engaging in tasks, understanding goals
  2. Developing and promoting values, procedures, and understandings
  3. Extending the adaptability of learners’ knowledge to new situations and circumstances through questioning, problem-solving, dialogues and group discussions
Research questions

• The goal of this literature review is to provide a holistic view on how guidance actualizes at the workplace by identifying practices, providers and supporting and hindering factors related to guidance and learning at the workplace.

RQ1 What kind of guidance practices are used at the workplace?
RQ2 Who provides guidance at the workplace?
RQ3 Which factors of guidance support or hinder learning at the workplace?
Method

• The review type for this study is a mapping review (Grant and Booth 2009).

• Search terms included guidance, counselling, supervision, mentoring, coaching, instruction, scaffolding, modeling, explanation, reflection and explorations in combination with the terms apprenticeship, workplace learning, on-the-job learning, work-based, vocational training and vocational education.

• In addition, journals focusing on workplace learning and vocational education were manually searched.
Method

- Search of peer-reviewed articles from the Education Resources Information Center and Education Research Complete databases resulted to **2275 articles** (after removing duplicates).
- First inclusion criteria (studies published between 1995-2015, full-text availability, English language) left us with **489 articles**.
- Two researchers read the articles and their reference lists (snowball method).
- Second inclusion criteria (focus on guidance in workplace learning) produced **final number of 18 articles**.
Method

• Total number of participants in the 18 reviewed articles was **3485**, of which 681 participated in qualitative and 2804 in quantitative studies.

• **Qualitative methods dominated the sample**, as they were applied in 10 studies between 1999-2015.

• Three studies (2008-2014) applied quantitative methods and four mixed-method studies (2000-2011) applied both qualitative and quantitative methods.
Results: What kind of guidance practices are used at the workplace?

• Experts and novices working together (experts monitoring, providing help if needed) [5]
• Explanations (providing information, categorisation, transferring tacit knowledge) [5]
• Reflection (conversations, discussions, feedback) [5]
• Scaffolding and fading [4]
• Observation and demonstrations [3]
• Independent work and experimentation [3]
Results: **Who provides guidance at the workplace?**

- **The entire work community** (including designated trainers, fellow workers and employers, clients) [10]
- Peers [7]
- **Teachers from vocational institutes** [5]
- Designated workplace trainers [2]
Results: Which factors of guidance support learning at the workplace?

• Indirect guidance / learning context [38]
  – Learner’s participation, legitimate and active role, agency, independent work, increasing responsibility

• Direct guidance [15]
  – Supportive relationship with a trainer who provides time and various types of guidance (share knowledge, stimulate questions, produce critical reflection)

• Connectivity [14]
  – Integration of theory and practice, personalization, individual learning and guidance needs

• Learner factors [12]
  – Initiativeness, responsibility, self-regulation, strong social skills
  – Prior experience, deliberate career choice
Results: Which factors of guidance hinder learning at the workplace?

• **Indirect guidance / learning context** [19]
  – Lack of resources and focus on productivity, power struggles, competition, learner’s marginal role

• **Connectivity** [8]
  – Discrepancies between learning environments: unstructured training at the workplace, e.g., teachers having limited available time

• **Direct guidance** [6]
  – Dependency and power relationship: trainer’s unpredictable reaction to requests for help, redundant guidance

• **Learner factors** [4]
  – Tiresome and introvert behavior, poor work ethic
Conclusions

• Guidance provided by members of the communities of practice invites opportunities for learners to participate in collective practices (Filliettaz 2011) by gradually taking on more responsibility and more demanding tasks as their skills develop.

• Techniques that are more trainer-led and easily carried out in the everyday work flow are in more frequent use, whereas techniques that require more time, reciprocality and activity from the community and learner see less frequent use.
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Introduction

• Workplace’s provide opportunities for learning (affordances), but also individual factors (engagement) are important (e.g. Billett, 2001).

• Workplaces are varying learning environments:
  – expansive vs. restrictive (Fuller & Unwin, 2003)
  – enabling vs. constraining (Ellström, 2011)

• Which factors are important and how to assess workplaces as learning environments?
1. Learning potential of the workplace (LPW)

- Work-based learning has two core components:
  - Interactional (from colleagues and supervisor)
  - Task-based (cognitive-behavioral, through reflection and experimentation) (Nikolova, Van Ruysseveldt, De Witte & Syroit, 2014)
2. Employee perceptions of workplaces as learning environments

- Work environment has certain characteristics:
  - Supervisors’ proximate support for learning
  - (Dis)satisfaction with learning
  - “Aids” to learning (sources of learning, methods of learning)
    (Coetzer, 2007)
3. Workplace learning support

- Task significance, variety and complexity
- Information processing
- Problem solving
- Planning, decision and methods autonomy
- Feedback
  (Harteis et al., 2015; Rausch, 2012), based on Karasek’s (1979) demand-control-support model
4. Workplace as learning environment (WLE)

- Seven areas constituting an expansive environment
- Two factors: issues related to learning environment and task complexity (James & Holmes, 2012) based on Fuller & Unwin’s (2003) expansive-restrictive framework
Research questions

• Quantitative (Study 1)
  – RQ1 How the dimensions of workplace as learning environment (WLE) are related to each other?
  – RQ2 How learner factors (age and gender) and contextual factors (organization size) are related to interpreting workplace as learning environment?

• Qualitative (Study 2)
  – RQ3 How is learning organized in workplaces?

• Mixed methods (Creswell & Plano Clark, 2011)
  – RQ4 What should be taken into account in workplaces?
A mixed methods approach on workplaces as learning environments

Study 1: Survey

- Online survey to Finnish vocational students 11/2014-1/2015.
- Total number of respondents was 1559, this study focused on a sub-sample of 305 apprentices from various fields (233 females, 76.4%; 72 males, 23.6%; average age 40.4 years, $SD=10.431$).

Age distribution of students in the sample ($N=1559$)

Similar to population distribution in 2015 ($N=249,816$)
A mixed methods approach on workplaces as learning environments

**Method: Measures**

*Workplace as learning environment* (WLE) (James & Holmes, 2012)

- 21 items on a 5-point self-rating response scale (*1=totally disagree; 5=totally agree*).
- The survey addresses seven main areas related to expansive learning environments:

| Dimension                                                        | Sample statement                                                                 |
|------------------------------------------------------------------|----------------------------------------------------------------------------------|
| 1. Participation and understanding of the workplace (3 items)   | “3. I understand the goals and aims of the workplace.”                           |
| 2. Task performance (4 items)                                    | “5. I use a range of skills in my work.”                                         |
| 3. Access to resources to help learning (4 items)                | “8. I have a mentor/coach at work.”                                              |
| 4. Judgment, decision-making, problem-solving and reflection (4 items) | “15. I have time to reflect on my work.”                                        |
| 5. Experience, task transition and career progression (3 items)  | “17. I am given time to work through tasks to develop my skill and knowledge.”    |
| 6. Status as a worker and a learner (2 items)                    | “20. I am recognized as a learner in the workplace.”                              |
| 7. Organizational development (1 item)                           | “21. The business goals take into account my goals.”                              |
Method: Analysis

- The survey data was analysed with traditional non-parametric statistics (Mann-Whitney U and Kruskal-Wallis H tests), but also Bayesian discrete methods were applied as those allow robust dependency and classification analysis of small categorical data (Myllymäki, Silander, Tirri, & Uronen, 2002; Nokelainen & Ruohotie, 2009).
Results RQ1: How the dimensions of WLE are related to each other?

Figure 1. Bayesian Network of the dimensions of Workplace as Learning Environment

- Versatile and challenging work tasks in collaboration with other workers and receiving feedback (WLE dimension 2) were positively related to experiences of getting various forms of support in the workplace (WLE dimension 3).
Results RQ2: How learner and contextual factors (age) are related to interpreting workplace as learning environment?

- Younger apprentices (below 35 years) self-reported to have less participation and understanding of the actions in the workplace than participants in two other age cohorts (35-44 and over 45 years), $\chi^2(2)=7.975$, $p=.010$.
- Older apprentices (over 34 years) felt that they were treated more like co-workers than the younger ones, $\chi^2(2)=7.885$, $p=.019$. 
Results RQ2: How learner and contextual factors (gender) are related to interpreting workplace as learning environment?

- Female apprentices (n=233, 76.4%) self-assessed higher values than males on three WLE dimensions:
  1. Participating and understanding their workplace \( [\chi^2(1)=17.041, p<.001] \);
  2. Performing tasks in the work \( [\chi^2(1)=8.542, p=.003] \);
  3. Resources available to learn at work \( [\chi^2(1)=6.648, p=.010] \).
Results RQ2: How learner and contextual factors (*company size*) are related to interpreting workplace as learning environment?

- Experience in various tasks within company, development of skills and career progression were self-assessed to be highest in the micro-sized companies, and lowest in large companies, $\chi^2(3)=7.680, p=.053$.

1. Micro, less than 10 persons (n=91, 29.8%)
2. Small, 10-50 persons (n=103, 33.8%)
3. Medium, 50-250 persons (n=53, 17.4%)
4. Large, more than 250 persons (n=56, 18.4%)
Study 2: Interviews

• Interview study examined three topics
  1. Individual level: Development of vocational expertise through learning and tasks related to work
  2. Environment level: Workplace as learning environment (incl. learning and guidance practices)
  3. Apprenticeship training as a whole (e.g. integration of school and work)

relating to the third research question: 
*RQ3 How is learning organized in workplaces?*
Method

• Semi-structured interviews were conducted with apprentices \( n=10 \), employers \( n=10 \), workplace trainers \( n=10 \) and co-workers \( n=10 \) in ten workplaces.
  – Interviews lasted 20-60 minutes, the interviews with co-workers were shortest (20-40 minutes).
  – Thematic analysis: coding, searching similarities/differences with inductive and deductive approach (Braun & Clarke, 2006; Vaismoradi, Turunen, & Bondas, 2013)

• Five workplaces from health and social services sector
  – one small and four medium-sized nursing and care homes

• Five workplaces from technology sector
  – three medium-sized enterprises in construction and two small enterprises in the area of metalwork and machinery
### Finnish apprenticeship training stakeholders (N=40)

#### Social and health care services sector: workplaces (n=5), participants (n=20)

|                      | Apprentice | Co-worker | Workplace trainer | Employer |
|----------------------|------------|-----------|-------------------|----------|
| **Age M (SD)**       | 33.0 (7.7) | 39.6 (12.1)| 46.4 (10.1)       | 54.6 (6.5)|
| **Male n (%)**       | 1 (20.0)   | 1 (20.0)  | 2 (40.0)          | 1 (20.0) |
| **Female n (%)**     | 4 (80.0)   | 4 (80.0)  | 3 (60.0)          | 4 (80.0) |
| **Work experience in current job M (SD)** | 1.9 (2.4) | 5.5 (3.6) | 8.2 (7.4)         | 12.2 (8.2)|
| **Work experience total M (SD)** | 7.9 (2.5) | 11.9 (5.7) | 20.4 (6.4)       | 33.0 (7.0)|
| **Workplace trainer experience M (SD)** | 7.1 (7.4) |          |                   |          |

#### Technology sector: workplaces (n=5), participants (n=20)

|                      | Apprentice | Co-worker | Workplace trainer | Employer |
|----------------------|------------|-----------|-------------------|----------|
| **Age M (SD)**       | 24.8 (3.3) | 43.0 (10.6)| 40.6 (11.5)       | 56.0 (6.5)|
| **Male n (%)**       | 4 (80.0)   | 5 (100.0) | 4 (80.0)          | 5 (100.0)|
| **Female n (%)**     | 1 (20.0)   | 0 (0.0)   | 1 (20.0)          | 0 (0.0)  |
| **Work experience in current job M (SD)** | 2.5 (1.8) | 13.4 (10.9) | 14.2 (9.0)       | 14.4 (11.0)|
| **Work experience total M (SD)** | 5.9 (2.9) | 25.8 (8.4) | 21.4 (14.0)      | 36.6 (10.3)|
| **Workplace trainer experience M (SD)** | 3.4 (2.2) |          |                   |          |
Results RQ3: How is learning organized in workplaces?

• Individual level: Development of vocational expertise through learning
  – Learning is considered self-directed, requiring individuals to take initiative and being responsible for their learning.

• Individual level: Tasks related to work
  – Social and health care sector: Fast transition to full participants, autonomous work and responsible work tasks
  – Technology sector: Slower transition to productive work through low-risk and easy tasks (safety issues, quality issues in production)
Results RQ3: How is learning organized in workplaces?

“They have to start from beginning, could I say that from sort of “odd jobs”. But then when you think about it, we have men, who have been here for 20 years and they are still doing those jobs. And some like to do those.”

(Trainer, technology sector)

“I see them [apprentices] as employees. I think they can this work, because these tasks are based on common sense. And the clients are quite easy, so it is easy to co-operate with them. We don’t have any challenging tasks.”

(Co-worker, social sector)
Results RQ3: How is learning organized in workplaces?

- Environment level: Workplace as learning environment
  - Social and health care sector: multi-professional co-operation and interaction (opportunities for feedback, assessment through discussions), collective support and trust, apprentices having an equal position in community.
  - Technology sector: supervision, tensions between young apprentices and more experienced workers, designating trainer and assessments merely a bureaucratic matter.
Results RQ3: How is learning organized in workplaces?

“Maybe during the first month she was more like a student. Now she is part of the staff like others. She is doing exactly same things, except from medication. I see her in an equal position with us. We haven’t made a fuss over her being a student.”
(Trainer, social sector)
Conclusions: What should be taken into account in workplaces?

• Apprentices are expected to be self-directed learners
  – Who is setting the goals?
  – How interaction and participation could be encouraged?

• Full participation and productive work are expected in employment-based apprenticeship training
  – How apprentices should acquire the knowledge and skills needed? (“workplace curriculum”, Billett, 2006)
    • Task progression
    • Opportunities for guidance and feedback
  – Are there time and other resources for practice and guidance?
Future research

• The study was based on self-report data, also WLE has its limitations

• To better understand the differences between different sectors and different kind of workplaces more qualitative data is needed (more about differences see e.g. Virtanen, 2013)

• The wider context of apprenticeship training should be further researched (e.g. the role of the teachers in relation to workplaces)
Thank you!

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