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Facilitating Career Learning in Virtual Reality: The DOTS model for Vocational Training and Career Guidance

Lecture

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Authors

Hannah Owens Svennungsen

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Summary

This lecture provides an overview of the DOTS model as a framework for facilitating career learning in virtual reality.

The lecture is designed for career counselors and vocational trainers.

After completing this lecture, the learners will be able to understand and reflect on how The DOTS model can facilitate career learning in Virtual Reality as a learning tool for students and other target groups.

Learning objectives

- Develop an understanding of the DOTS model and its four components: decision learning, opportunity awareness, transition learning, and self-awareness.
- Understand how the DOTS model can serve as a framework for facilitating career learning in virtual reality.
- Learn how to formulate reflective questions in alignment with the DOTS model.

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Facilitating Career Learning in Virtual Reality: The DOTS Model for Vocational Training and Career Guidance

My name is Hannah Owens Svennungsen. I work as a teacher and researcher at NTNU. I teach in the master degree of guidance where career guidance is an important topic. I also do research in the career guidance field.

In this lecture my plan is to discuss the following title: Facilitating Career Learning in Virtual Reality: The DOTS Model for Vocational Training and Career Guidance. The presentation will discuss the following themes:

- VR for Vocational Trainers and Career Guidance: I will explore its application within the DOTS model framework. The DOTS model is a career learning framework aimed at fostering vocational identity, career competence, and employability (Chucwuedo, Onwusuru & Agbo, 2021; Hughes and Meijers, 2017; Murumgami & Nel, 2012; Pitan & Atiku, 2017).

- Application of the DOTS Framework: This framework is applied in career guidance and vocational training, either explicitly or implicitly, often using different terms or concepts. However, this does not mean the DOTS model is fundamentally different from the approaches commonly used by career counselors or vocational trainers.

- Integrating DOTS with VR Technology: While the DOTS model is widely recognized in both practical career guidance and academic research (Hughes & meijers, 2017; Law, 1999, McCash, 2006; Plant, 2014), limited studies have examined its combination with VR technology. To address this gap, I will provide examples and ideas on how to integrate the two.

This lecture aims to highlight the potential for combining The DOTS career learning framework with innovative VR technologies to enhance vocational training and career guidance practices.

Career guidance, vocational training and VR

Career guidance plays a vital role in helping individuals navigate their working lives (Puka, 2022), while vocational training complements this by equipping them with the practical skills and knowledge needed for specific careers (Watts, 2006). Research shows that career guidance is most effective when it provides authentic and realistic experiences (Mann, Denis & Percy, 2021), and this is where Virtual Reality (VR) has the potential to be a transformative tool.

By offering structured career learning activities, VR can significantly contribute to the development of career career learning and competence. Its ability to replicate real-world environments through immersive and interactive experiences enhances traditional vocational training methods (Tan, Xu, Li & Chen, 2022), making career learning more engaging, enjoyable, and effective. The pedagogical value of VR is highlighted in the Norwegian evaluation report (2024) on its use in apprenticeships within the Norwegian Labour Welfare Administration. The report underscores VR's capacity to provide realistic and engaging career learning experiences, offering individuals a solid foundation for reflection and career competence development.

Career guidance practice encompasses three key dimensions: career information, career learning, and career competence. In this lecture, the focus is on career competence and career learning. Career competence refers to the skills and abilities individuals need to effectively manage current and future career challenges, while career learning describes the process through which these competencies are developed.

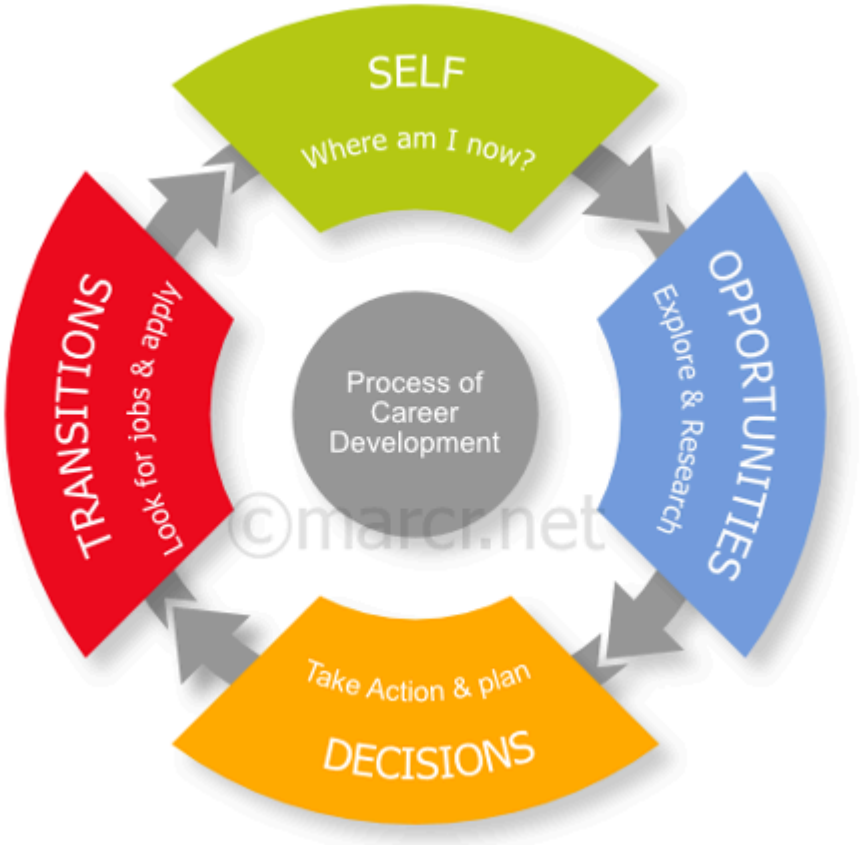
Vocational trainers and career guidance counselors share common ground (Zelloth, 2014), particularly in their use of VR as a learning tool. By harnessing VR's immersive and interactive potential, they can create more effective, personalized, and engaging training experiences. This innovative approach not only enhances

understanding of various jobs and sectors but also supports the development of essential career competencies, empowering individuals to navigate their working life with greater confidence and capability.

By integrating the DOTS Model with VR technology, vocational trainers and career guidance professionals can create innovative career learning environments that enhance career competence and prepare individuals for working life. .

Introduction to the DOTS Model

The DOTS Model, developed by Tony Watts and Bill Law (Law, 1996, 1999), can be defined as a structured career learning framework that encompasses four components: Decision Learning, Opportunity Awareness, Transition Learning, and Self-Awareness. Each component addresses important aspects of facilitating career learning and competence, providing a holistic approach to developing career competence.



Integrating Virtual Reality (VR) with the DOTS Model seeks to enhance training experiences by making them more engaging, practical, and effective. Through its ability to simulate real-world job environments, offer interactive learning opportunities, and provide personalized feedback, VR has the potential to enrich each component of the DOTS Model within vocational training contexts.

The Norwegian evaluation report (2024) highlights that opportunity awareness was the primary concept individuals explicitly developed through VR apprenticeship applications. Additionally, counselors noted that post-activity discussions with clients often facilitated self-awareness, transition learning, and decision-making. However, it is important to recognize that career counselors or vocational trainers need not

address every component of the model in every situation. The focus should align with the individual student's needs in developing career competence.

Another critical factor for the effective application of the DOTS Model is fostering a growth mindset in students, as outlined by Dweck and Yeager (1999). A willingness to learn and motivation for career development are essential for meaningful engagement with the model.

When applying the DOTS Model in a VR context, it is crucial to consider the intention behind its use. This involves formulating flexible learning objectives, defining clear learning outcomes, and designing reflective VR questions to ensure the approach is tailored to the unique needs of learners and effectively supports their career competence development.

Decision learning competence

Decision learning is fundamentally about acquiring the skills and knowledge needed to make informed career decisions. In vocational training, it supports individuals in selecting career paths that align with their interests and abilities. By understanding one's own preferences and strengths, individuals can develop competence in decision-making. Importantly, decision learning goes beyond simply making the "correct" choice; it focuses on understanding the process of decision-making itself. People vary widely in their experience with decision-making—some have extensive experience, others have some, and some may have none at all. Regardless of the level of experience, the key lies in the ability to reflect on one's decision-making process. This reflective practice is essential for developing greater self-awareness and improving decision-making skills over time.

Virtual Reality (VR) can play a valuable role in facilitating this reflection phase. VR provides immersive environments where trainees can explore various vocational paths, such as virtual apprenticeships. These experiences allow users to engage with the daily tasks and responsibilities of different professions, offering a realistic preview of potential career options. Additionally, VR enables trainees to participate in role-playing scenarios that simulate workplace challenges, allowing them to practice decision-making in a safe and controlled setting. For example, users might choose between different job tasks or navigate complex workplace situations. These activities foster critical reflection, helping individuals better understand their decision-making process and develop the skills necessary to make thoughtful career choices.

Facilitating decision-making competence involves several key dimensions, such as understanding, identifying, evaluating, and making informed choices. For each dimension, I have outlined suggested learning objectives and outcomes, which are intended as examples:

Understanding the Decision-Making Process:
- Objective: Learn about different jobs and understand what factors are important when making a career choice.
- Outcome: I have gained greater insight into how to make career decisions.

Identifying Options:
- Objective: identify career options by considering personal interests, skills, and market demand.
- Outcome: I have a clearer understanding of how identifying options improves my decision-making skills.

Evaluating Choices:
- Objective: Learn how to evaluate and compare different career options effectively.

- Outcome: I have gained more insight into the process of evaluating choices.

Making Informed Decisions:
- Objective: Understand how to make decisions based on a thorough understanding of available information, personal values, and external factors.
- Outcome: I feel confident in making career decisions that align with my strengths and interests.

It is important to keep in mind that not every dimension is relevant for all individuals. It depends on the person who is developing their career competence.

Reflective questions

For each learning objective and outcome related to decision-making competence, I have formulated reflective questions that can be used in the learning process to facilitate career learning with job-simulated VR apps:

1) **Understanding the decision-making process:**

- What decision-making strategy did you find most helpful?

- Why did you want to try the Blue Sector app? What did you like about it?

- Which factors are most significant to you when choosing between the Blue Sector, construction industry, or cloud engineering? How do these factors influence your choice?

- Have you learned strategies from using the apps to prioritize your career options based on professional and personal goals?

2) **Identifying options:**

- Did the apps align with your interests, perceived skills, and the demand for work in the Blue Sector, construction industry, or cloud engineering?

- How well did the apps help you weigh the pros and cons of different career paths?

- Has your decision-making process changed in any way after trying the Blue Sector apps?

3) **Evaluating choices:**

- If faced with job offers, how confident are you in your ability to evaluate them?

Do you think you would thrive in the Blue Sector, construction industry, or cloud engineering? Why or why not?

4) **Making informed choices:**

- After completing the apps, do you feel better prepared to make a career choice? Why or why not?

- Did the different work tasks in aquaculture, construction, or cloud engineering provide insight into your career choices, and did they impact your decision-making process?

- How did the outcomes of your decisions compare to your expectations?

Opportunity Awareness

Opportunity Awareness involves understanding the range of career opportunities available and knowing how to access them. This component is crucial for broadening trainees' perspectives and helping them discover potential career paths. It entails being informed about various career opportunities and understanding labor market dynamics. In general, VR immersive experience allows for direct interaction with companies and provides a deeper understanding of available opportunities.

VR Industry Tours:Users can take VR tours of different trades and industries, gaining insights into various work environments, daily tasks, and industry demands. This helps them understand the practical aspects of different careers.

Three important dimensions are often defined in opportunity awareness: exploring career paths, labor market information, and employer expectations. For each dimension, I have formulated suggested learning objectives and outcomes in relation to VR job simulation apps. These are only examples:

- **Exploring career paths**

- Objective: Gain knowledge about industries, professions, job roles, and required qualifications.

- Outcome: I have a clear understanding of the job market through the apps.

- **Labor market information:**

- Objective: Understand trends in the job market, such as in-demand skills, emerging fields, and employment patterns.

- Outcome: The apps provided me with sufficient information about the skills needed and what I need to develop.

- Employer expectations:

- Objective: Be aware of what employers are looking for in terms of skills, experience, and qualifications.

- Outcome: I learned the skills and qualifications needed for different roles and industries.

It is important to keep in mind that not every dimension is relevant for all individuals. It depends on the person who is developing their career competence.

Reflective questions

For each learning objective and outcome in opportunity awareness, I have formulated reflective questions that can be used in the learning process to facilitate career learning with job-simulated VR apps

1) Exploring career paths:

- After trying the apps, which opportunities do you feel more prepared to explore further?

- Were there any opportunities that you had not considered before trying one of the apps?

- What did you learn about the work environment and job roles in feeding salmon, inspecting fish, and sorting, cutting, and packaging fish? How does this align with your interests?

- What did you learn about installing and replacing hard drives, and performing updates in cloud engineering? What did you learn from assembling a wall or a wooden frame in the construction industry? Did you discover any unknown skills?

2) Labor market information:

- What insights did you gain from the blue sector industry, construction industry, or cloud engineering?
- How can these insights help you pursue the development of your working skills in this sector?

3) Employer expectations:

- Do you feel confident in identifying the required qualifications for these roles?
- Did you learn the key skills needed for the job?
- Did the feedback on your performance in the different tasks increase your insight into these jobs?
- How did the demanded skills in the construction industry affect your perception of the job?

Transition learning

Transition learning focuses on preparing individuals to effectively manage career changes and transitions. This includes moving between jobs, adapting to new roles, and progressing within an organization. The goal is to acquire the skills necessary to navigate these changes.

Using VR for Transition Learning:

- Simulated Work Environments: VR allows users to experience new job roles and tasks in a simulated setting, helping them gain practical skills and build confidence before transitioning into a new career. This includes simulations of typical workdays in various roles, such as those offered in VR apps.

- VR Adaptation Training: VR enables users to practice adapting to new work environments, tools, and procedures. This is especially valuable for those transitioning into unfamiliar industries or roles.

Two key dimensions are often highlighted in transition learning: the shift from education to employment, and the development of resilience and adaptability. For each dimension, I have formulated suggested learning objectives and outcomes in relation to VR job simulation apps. These are provided as examples.

- **Education to Employment:**
  - Objective: Gaining insight into strategies for transitioning from education to the workplace.
  - Outcome: I feel prepared to handle the challenges of moving from education to the workplace.

- **Resilience and Adaptability:**
  - Objective: Developing the ability to cope with change, setbacks, and transitions, such as job loss or career change.
  - Outcome: I am ready to adapt to a new work environment.

Problem-solving in VR can enhance resilience and improve adaptability. VR provides opportunities to engage in various problem-solving tasks, helping individuals build the skills needed to navigate new environments and overcome diverse challenges effectively.

It is important to keep in mind that not every dimension is relevant for all individuals. It depends on the person who is developing their career competence.

Lifelong learning and career progression are two additional key aspects of transition learning. As circumstances and careers evolve, it is essential for VR career guidance and vocational training to highlight the importance of adapting to these changes and continuously developing skills.

Reflective questions

For every learning objective and outcome in transition learning I have formulated reflective questions that can be used in the learning process to facilitate career learning with job-simulated VR apps.

1) Education to Employment:

- Can you rate your confidence in navigating transitions, such as moving from school to work?

- What challenges do you anticipate during the transition?

- How confident are you in understanding workplace expectations based on the apps?

- What are the biggest challenges, and how have the apps helped you address them?

- What areas do you need to improve in order to ensure a smooth transition from VR experiences in the blue sector, construction industry, or cloud engineering to actual physical work experience?

- Did feedback on your performance in the different apps provide any insight into what is important to learn for making the transition easier?

- Did the different tasks in construction or the blue sector help you prepare for the transition?

2) Resilience and Adaptability:

- Do you feel prepared for handling unexpected changes after trying the apps?

- If you have been offered a position, how confident are you in making the necessary adjustments?

- How did you cope with the different tasks and problem-solving challenges in each of the apps?

- How did you manage tasks such as changing hardware or feeding the fish?

Self- awareness

Self-awareness involves understanding one's strengths, weaknesses, interests, and values. It is crucial for making career choices that align with an individual's personal attributes and aspirations. Self-awareness plays a key role in making career decisions that are congruent with one’s values, interests, and skills.

Using VR for Self-Awareness:

- VR Self-Assessment Tools: Users can engage in interactive VR self-assessment exercises that help identify their strengths, interests, and career preferences. These tools can be tailored to provide personalized feedback. For instance, if a student tries a construction app and doesn’t enjoy it, it offers valuable insight into their general job interests. Disliking a particular experience is not necessarily negative; it provides important information about the student's self-awareness, especially regarding their preferences. Additionally, it can serve as an icebreaker, sparking discussions about interests and career goals.

- Reflective VR Exercises: VR applications can also be designed to facilitate reflection, allowing users to explore their career goals and aspirations in a more immersive manner. This helps users build a deeper understanding of themselves and their career direction.

- Personalized VR Experiences: VR experiences can be customized to match individual preferences, helping users explore careers that align with their personality and skills. For example, a user might try a construction app and realize that this is the career path they want to pursue. Alternatively, they may think they're interested in cloud engineering, but after exploring the blue sector, they realize that aligns more with their interests. Disliking any of the options might also be enlightening, as it reveals that the career options do not align with their skills or interests.

Three important dimensions are often defined in self-awareness: identifying strengths and weaknesses, personal values and motivations, and setting career goals. For each of these dimensions, I have formulated suggested learning objectives and outcomes in relation to VR job simulation apps. These are just examples.

- Identifying strengths and weaknesses:

Objective: Understand one's abilities, preferences, and areas for improvement.

Outcome: I have a clear understanding of my strengths and weaknesses.

- Personal values and motivations:

Objective: Reflect on what is important in one's career, such as work-life balance, job satisfaction, and personal fulfillment.

Outcome: I have a clear understanding of my values and motivations.

- Setting career goals:

Objective: Establish clear, achievable career goals based on self-assessment and align them with broader life goals.

Outcome: I have a strong sense of my vocational identity and self-awareness.

It is important to keep in mind that not every dimension is relevant for all individuals. It depends on the person who is developing their career competence.

Reflective questions

For every learning objective and outcome in self-awareness I have formulated reflective questions that can be used in the learning process to facilitate career learning with job-simulated VR apps.

1) Identifying strengths and weaknesses:

• What are your strongest skills?

• In what way did the apps help you connect to your strengths and interests?

• Describe one insight about yourself that you gained through trying out the apps.

• Do you feel more confident in explaining your career aspirations?

• What was most effective in trying out the apps for identifying your strengths and weaknesses within the blue sector, construction industry, or cloud engineering?

• Did you discover any new skills that you were not aware of?

2) Values and motivations:

• How can you use your strongest skills in the blue sector, construction industry, or cloud engineering app?

• Did feedback on performance give you insight into your skills, motivation, and values?

• How did the different tasks motivate you?

3) Career goals:

• In what way can the blue sector app, construction industry, or cloud engineering increase your self-awareness and vocational identity?

Integrating the DOTS model in VR: Application and considerations

What is the best way to integrate the DOTS model into VR applications for vocational training and career guidance? Should reflective questions be embedded directly into the VR apps for users to consider while engaging with various job simulations, or should these reflections occur afterward with a vocational trainer or career counselor, focusing on the different aspects of the DOTS model? There is no definitive answer to this question. However, vocational education institutions and career guidance practices can effectively integrate the DOTS Model into VR technology by designing programs that comprehensively address each component. This integration has the potential to significantly enhance the quality and impact of vocational training and career guidance, creating meaningful and engaging career learning experiences.

Key considerations include the following:
- Curriculum Design: Ensure VR programs are thoughtfully aligned with the components of the DOTS Model and tailored to meet the specific needs of the trainees.
- Evaluation and Feedback: Regularly assess the effectiveness of the VR training programs and gather feedback from participants to identify areas for improvement.
- Target Groups: Clearly define the users and their intended outcomes. Customize the learning process to suit the needs, abilities, and objectives of the specific target audience.
- Planned Reflection: Incorporate structured reflection sessions that emphasize collaborative learning, encouraging users to share insights and experiences.
- Information Overload: Manage the volume of information to prevent overwhelming participants and ensure learning objectives are clear and achievable.
- Reflection Levels: Design reflective activities that foster deep, meaningful engagement with the DOTS Model, helping users connect their experiences to their career development.

Through the thoughtful formulation of objectives, outcomes, and reflective questions, the DOTS Model can be effectively aligned with VR technology to achieve these goals. Whether reflection occurs during the VR experience or afterward, the focus should remain on fostering purposeful engagement and meaningful career learning.

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