Lesson Plan

Module: Integrated smart workplace **Learning Unit: How can 3D printing help small businesses?**

Desired Core professional goal Learners will be able to – understand and effectively utilize 3D printing technology in their businesses.	**Benchmark** Robotics
Level Standard	**Framework** Empower

Professional micro-learning outcomes

Learners will

- understand the basics of 3D printing technology and its applications in various industries.
- identify potential benefits and opportunities that 3D printing can bring to small businesses.
- evaluate the feasibility and cost-effectiveness of integrating 3D printing technology into their specific business models.
- develop a plan to integrate 3D printing technology into their businesses, including identifying suitable applications and potential challenges.

Micro-learning activities

Learners will

1. watch the Standard level: Module 4: Empower: How can 3D printing help small businesses? https://youtu.be/mpGD4OHMR4Q (3:12)
2. watch the podcasts: How can 3D printing help small businesses?
   a. Podcast: Case studies & success stories of other businesses that have implemented 3D printing https://youtu.be/T4XgF-11VSw (3:12)
   b. Podcast: Potential challenges in integrating 3D technology and how to overcome them https://youtu.be/TJ8vuDZbJWU (2:02)

3. have an option to do the following activities:

    a. **Feasibility and cost-effectiveness of integrating 3D printing technology into your business**

To evaluate the feasibility and cost-effectiveness of integrating 3D printing technology into your specific business models, go through a feasibility analysis exercise to determine if 3D printing is suitable for your business. Consider factors such as the type of products you offer, the volume of production, and the market demand. Think about the initial investment costs, ongoing maintenance, and potential return on investment. It is important to have a clear understanding of the costs involved before making any decisions.
Check out the Feasibility and Cost Analysis of 3D printing technology integration, which will facilitate your evaluation process. After assessing the feasibility and costs, you move on to integration planning.

b. Developing your 3D-printing technology integration planning

Think about your current products or services and how 3D printing could enhance or expand them. How can it enhance your current products or services? Are there any new opportunities that 3D printing can open up for your business? Try to think creatively and consider both practical applications and innovative ideas. For example, a micro or SME owner in the jewellery industry could explore using 3D printing to create custom jewellery pieces or prototypes for new designs. A furniture maker could consider using 3D printing to create unique and intricate decorative elements for their products. A small electronics company could use 3D printing to create custom enclosures or prototypes for new electronic devices.

Check out the Podcast: Case studies & success stories of other businesses that have implemented 3D printing: https://youtu.be/T4XgF-11VSw (3:12), which will help you identify potential applications of 3D printing technology. Once potential applications have been identified, explore potential challenges and how to overcome them. Listen to the Podcast: Potential challenges in integrating 3D technology and how to overcome them: https://youtu.be/TJ8vuDZbJWU (2:02) for more feedback and insight.

Follow the guidelines for Developing a 3D printing integration plan for your business to help you develop your own based your business needs. Use the 3D printing integration action plan template we provide to help you develop your own Action Plan.

Finally use the Self-Assessment Checklist for Evaluating your Action Plan to assess your plan. You may do this activity either individually or collaboratively with your team or other learners exchanging feedback for collaborative and mutual improvement in low scores using our course forum our chatroom. You may introduce yourself to the course forum and make a

team with other learners sharing the same interests and professional sector. We highly recommend working collaboratively throughout the course.

4. have an option to see more resources:
    a. 3D printing - OpenLearn - Open University: The article explains how 3D printing works by depositing polymer droplets on a substrate, and the advantages and limitations of this technique. It also provides some links to other related topics and resources.
    b. Childhood Accident Transforms Adversity Into Passion For Helping Others | U.S. Small Business Administration (sba.gov): The article tells the story of Rakesh Srivastava, a Nebraska small business owner who overcame childhood adversity and became a successful innovator in prosthetics and orthotics integrating 3D technology. He received help from the SBA and its partners, and was named the SBA Nebraska Small Business Person of the Year for 2020.
    c. 3D Printing with Windows 10 | Free Online Course | Alison: This free online 3D printing course will teach you everything you need to know about 3D printing with Windows 10. You will study the 3D Manufacturing Format (3MF) which allows design applications to send full-fidelity 3D models to a mix of other applications, platforms, services, and printers, the different use cases for a 3D printer, the applications you can use to make, examine, and share 3D models, plus a whole lot more!
    d. 3D Printing | How To Use A 3D Printer | Alison: This free online course on How To Use A 3D Printer will teach every professional in the areas of engineering, design, and manufacturing about 3D printing technology and its applications. Many manufacturing industries now use 3D printing hardware and software technology to manufacture their products. With the help of this course, you will learn how to build a three-dimensional object from a computer-aided design model so make sure to check it out!
    e. Additive Manufacturing Architecture | Free Online Course | Alison: This free online course provides you with a comprehensive understanding of 3D printing. The manufacturing industry has evolved and now uses advanced processes and cutting-edge technologies like additive manufacturing to meet soaring production goals. This course trains you to draw on these dynamic new procedures to help you achieve your professional goals and get ahead in your manufacturing career.
    f. Webinars: See our Collection of Free 3D Printing Webinars: This is a website that offers free educational webinars, product demos, and virtual events on various topics related to 3D printing, such as materials, applications, design, post-processing, quality management, and more. You can register for upcoming sessions

or watch the recordings on-demand. The webinars are hosted by Formlabs, a leading provider of 3D printing solutions.

g. Additive Manufacturing & 3D Printing - SME: This is a website that provides news, articles, expert opinions, and resources on additive manufacturing and 3D printing. You can learn about the latest trends, innovations, challenges, and opportunities in the industry. You can also access free webinars, white papers, eBooks, case studies, and reports from SME's Manufacturing Resource Centre.

h. 3D Printing Webinars | Materialise: This is a website that features free webinars on 3D printing topics such as software, medical devices, orthognathic surgery, mass customization, and more. You can learn from the experts and leaders in the industry and get inspired by their stories and insights. The webinars are organized by Materialise, a global leader in 3D printing software and services.