

# Cobots in Action: PHEL's Vision for Empowering Workforce Development and Efficient Laboratories

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## Introduction

In the era of advancing technology, collaborative robots, or cobots, are emerging as valuable tools for facilitating workforce development. Unlike their traditional counterparts, cobots are innovatively engineered to synergize with human operators, excelling at automating monotonous and repetitive tasks. This synergy not only bolsters efficiency and productivity but also substantially diminishes the likelihood of workplace injuries and procedural errors.

We've carefully followed the International Organization for Standardization (ISO) standards and the Occupational Safety and Health Administration (OSHA) guidelines to make sure cobots can be safely integrated into workspaces with people. Our straightforward risk assessment process helps us spot and handle any safety concerns with cobot-related activities, like automated pipetting, making sure they're both safe and helpful for workers.

## Methodology

1. Review current trends in collaborative robotics to determine their applicability and future potential in public health labs.
2. Assess the advantages on increased automation, like reducing injuries and boosting efficiency, alongside risks such as regulatory compliance and impact on staff well-being.
3. Identify leading cobot companies and technologies suitable for our operations.
4. Survey our laboratory staff to analyze highly repetitive tasks in our laboratories, particularly those involving the distribution of samples into plates and tubes of varying sizes using pipettes.
5. Develop "Cobot Central," an online informational and training portal, to facilitate cobot integration.
6. Evaluate and test various pipetting solutions from different vendors to select and deploy the most effective ones for our laboratory and staff requirements.



ASSESS NEEDS



COORDINATE RISK  
ASSESSMENT



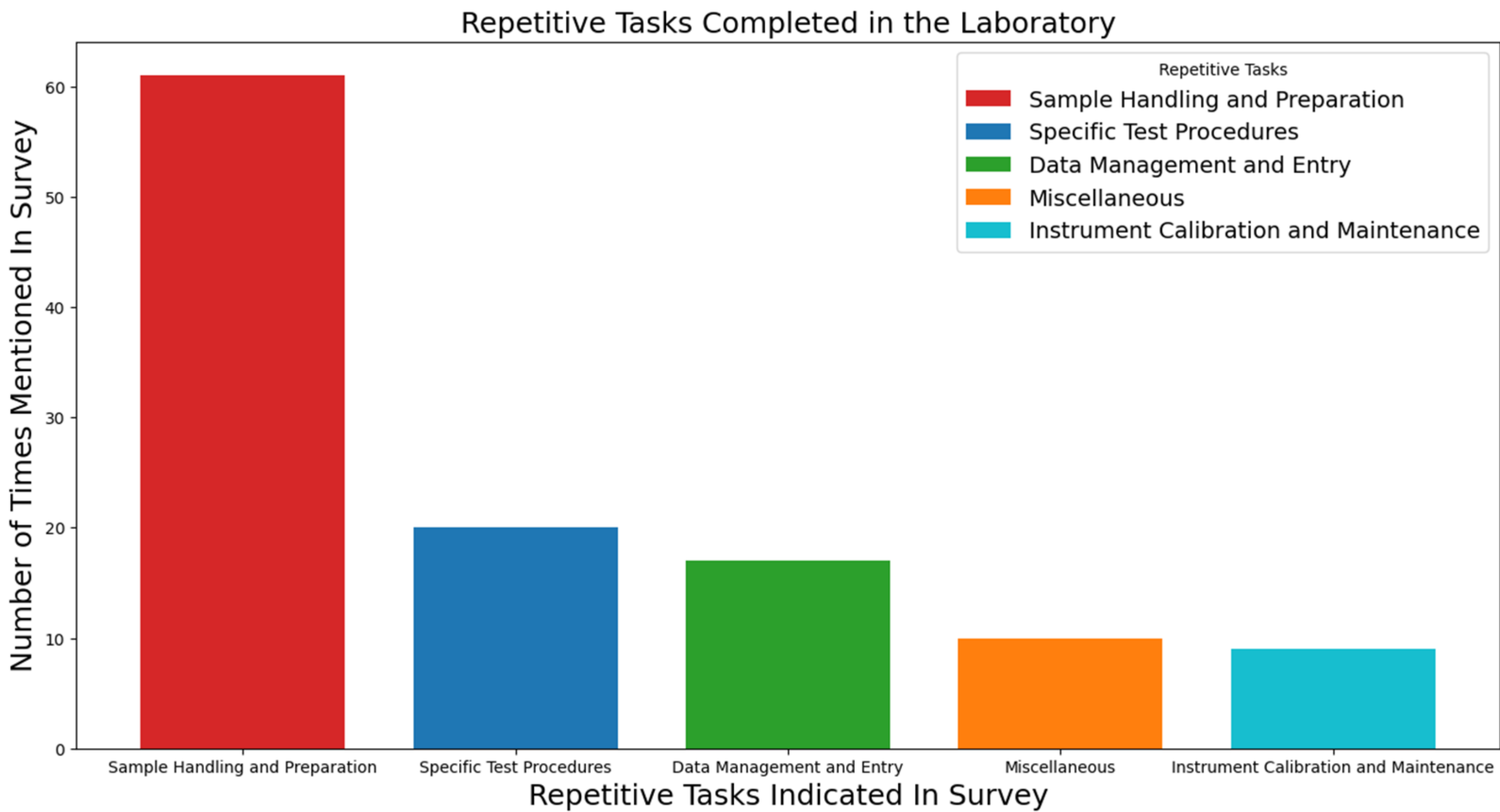
PROVIDE TRAININGS  
& RESOURCES



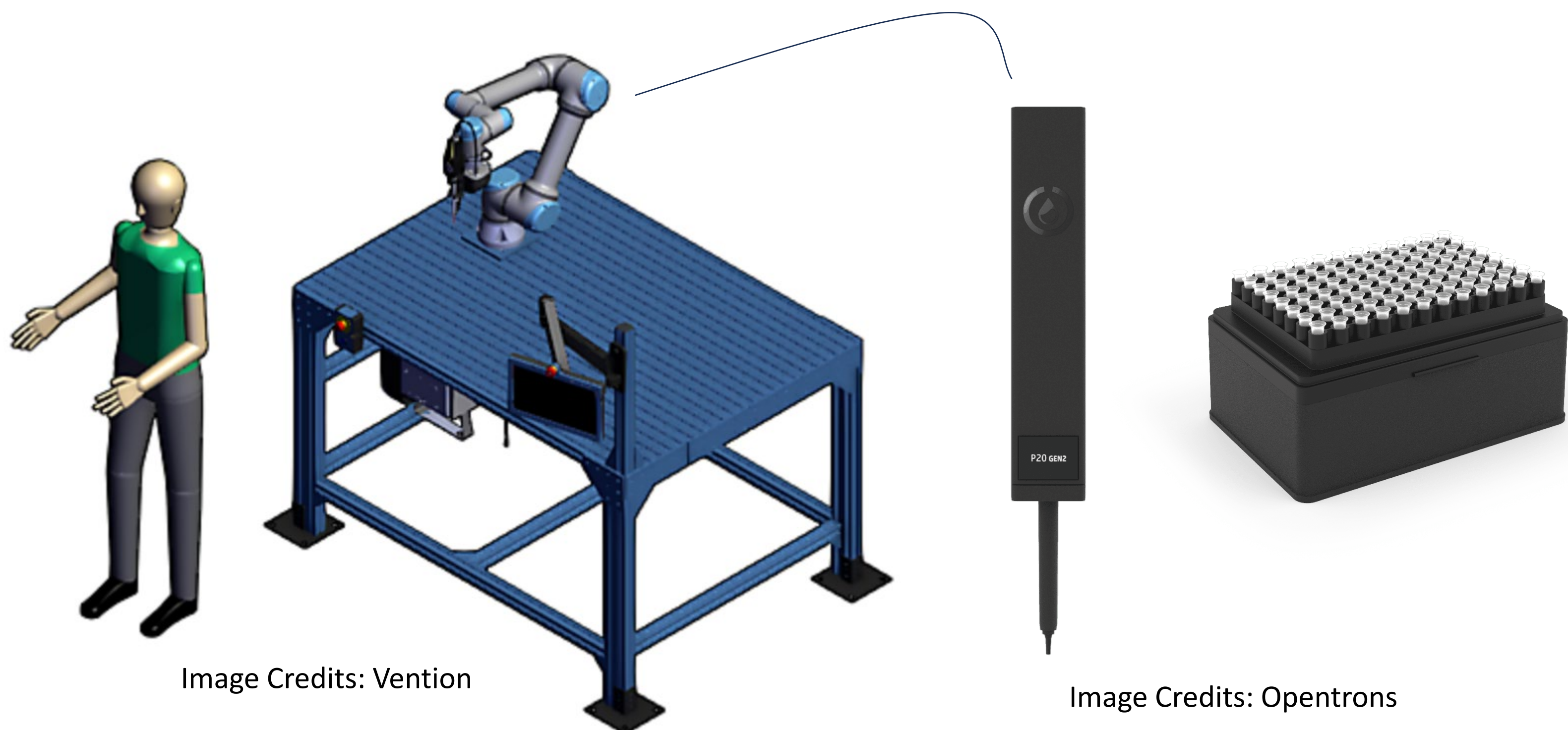
CONDUCT  
KNOWLEDGE CHECKS

## Results

1. Securing funding, PHEL advanced cobot implementation and established an Outreach Technology Training center to upskill staff.
2. Examination of ISO standards, such as ISO 10218-1, ISO 10218-2, ISO 13849-1, and OSHA guidelines facilitates the safe and seamless integration of cobots.
3. A consistent, systemic framework is applied to understand our laboratory needs and provide the training and tools to success in working safety and effectively with cobots.
4. Our survey identified pipetting as a highly repetitive task in laboratory sample handling and preparation, frequently involving volumes from 1µL to 300µL. Such precise volume measurements are essential in molecular testing, particularly across different molecular testing and sequencing workflows.



5. Our assessment identified that integrating cobots with interchangeable digital pipettes and tips support provides the most efficient initiation of cobot utilization in laboratory processes.



## Conclusions

- Cobots have demonstrated exceptional capability in performing simple, repetitive tasks with precision, thereby optimizing the handling aspects of laboratory operations.
- Humans bring indispensable cognitive skills to the laboratory environment, enabling a nuanced understanding and adaptability to task changes, enhancing problem-solving and decision-making processes.
- Integration of cobot assistance in non-ergonomic workstations aims to reduce physical strain on staff and promoting a safer and more comfortable workplace.
- PHEL's systematic approach to cobot selection, considering staff needs and laboratory workflow, resulted in tailored recommendations aligned with operational needs.
- Automation of repetitive tasks empowers laboratorians to focus on higher-level goals, fostering skill enhancement and career advancement.
- Integration of new technologies like cobots furthers enhancements in workforce efficiency and empowerment in public health laboratories.

## References

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## Acknowledgements

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3. Opentrons, New York, USA
4. The Knotts Company, New Jersey, USA
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6. Telamon Robotics, Indiana, USA
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