

Workshop -Faculty and Student Perceptions on Shared Learning Materials for Advanced Manufacturing (SLAM): Building Momentum Through Workshops



Project Directors

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SLAM is a Learning Repository for Advanced Manufacturing Technology using 40 years of AMT materials contributed by Dr. Wysk and others willing to share their teaching materials. The intent of STAM is to improve AMT instruction and get new AMT methods into the classroom more quickly. Special thanks to NSF for their support of DUE-1841441.

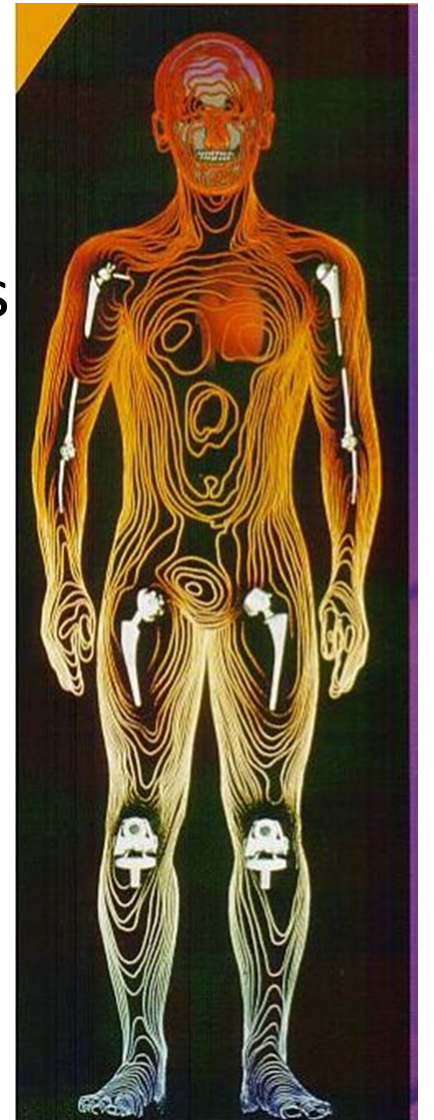
Introduction



- Basic hypothesis - We believe that by creating an Open Learning Repository for Advanced Manufacturing Technology (AMT) using materials contributed by AMT instructors, the learning environment will be improved, the cost reduced and currency of materials will be improved
 - What is SLAM?
 - Community of Advanced Manufacturing Technology Professors
 - Repository for teaching materials
 - NSF funded workshop project
 - An opportunity to create an organic refuge for advanced manufacturing
 - Workshop 1 & 2 summaries
 - Student survey
 - Roadblocks
 - Next steps

Dr. Richard Wysk

- I am Rick Wysk, and I have been teaching a BROAD set of manufacturing courses for 43 years. I am not quite as bad as this picture, but I am about half way there.
- I am trying to form a “manufacturing community” focused on teaching modern manufacturing while bringing excitement about taking things into the next generation.
- I retired last summer and would like to leave a “footprint” in this community.



Gül Okudan Kremer

- Currently, Professor and C.G. “Turk” and Joyce A. Therkildsen Department Head at Iowa State University
- Served on the faculty at The Pennsylvania State University
- Served as an NSF Program Manager for the Engineering Education Division
- Active in IISE, ASME, ASEE, ABET



Dr. Russell King

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- **Russell King** is the Henry L. Foscue Distinguished Professor of Industrial and Systems Engineering (ISE) at NC State University. He is both Alumni Distinguished Graduate Professor and Alumni Distinguished Undergraduate Professor and is Fellow of the Institute of Industrial and Systems Engineers. He has consulted for many companies including Ford Motors, The Gap, Dillards Department Stores, and the Institute for Defense and Business. He has received numerous awards for his teaching, advising, and research including the Albert G. Holzman Distinguished Educator Award and the Technical Innovation in Industrial Engineering Award from IISE. Previously, he served as Director of CAMAL and Director of Graduate Programs for the ISE Department.

Brief update

- Developed a “Community of Advanced Manufacturing Instructors”
 - ~70 people have communicated with SLAM
 - 24 Institutions
 - Conducted 2 surveys to help with Roadblocks
 - Conducted 2 workshops
 - Created a Yearly Progress report
 - Developing a proposal for an IUSE Phase II Grant
 - Presented SLAM concept at 2019 IISE Annual
 - Created a prototype SLAM website
 - Have populated the website with`
 - ~ a dozen AMT chapters with 10 more coming online this year

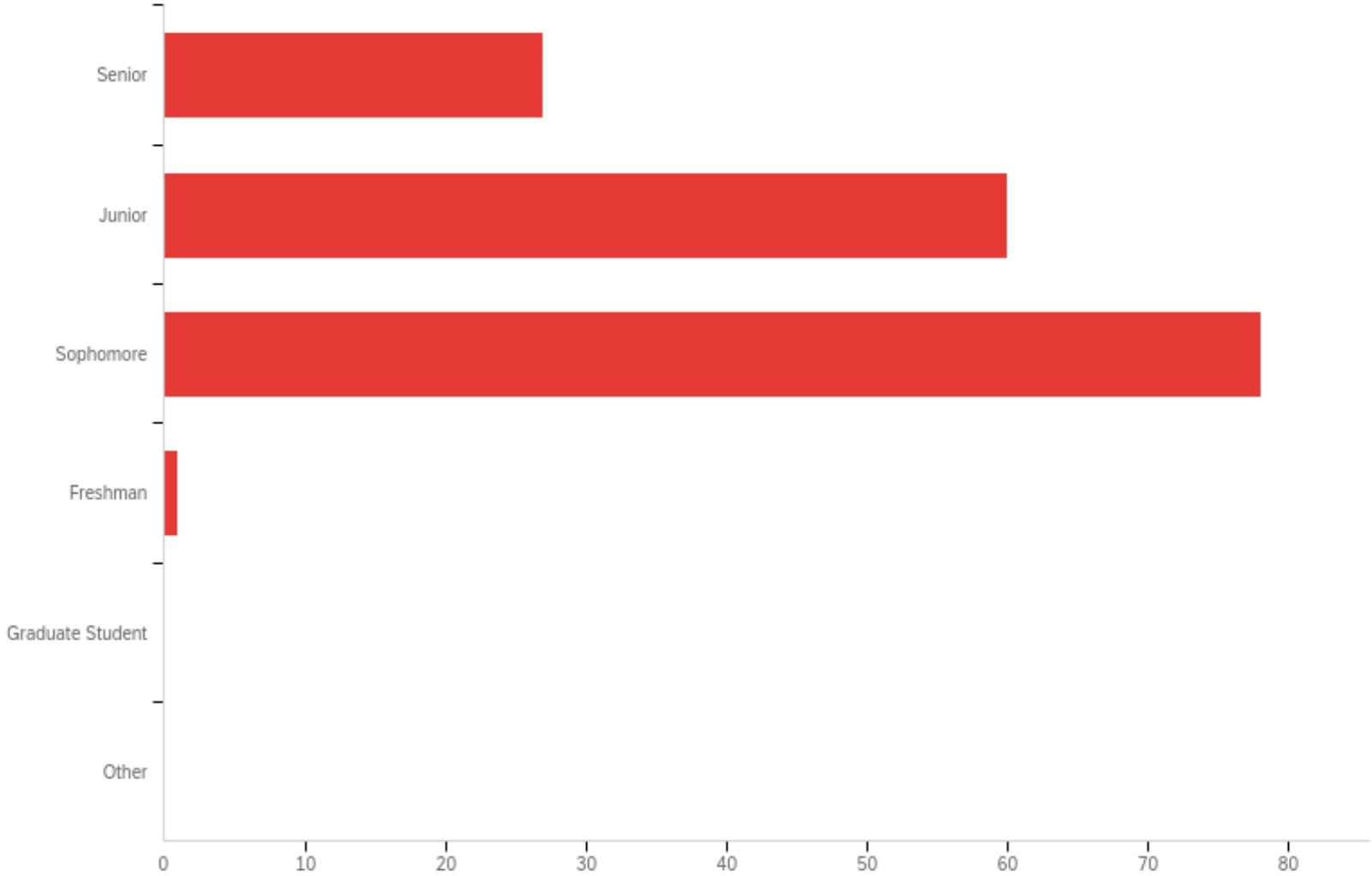
Workshops and surveys

- Workshop #1 was held in-person in Orlando, FL at 2019 IISE Annual meeting
 - 28 attendees from 12 universities attended
 - Discussed potential roadblocks
 - Suggested a instructor survey for people teach advanced manufacturing
- Workshop #2 was a combined in-person and on-line meeting held in Raleigh, NC on September 17, 2019
 - ~27 attendees from 14 universities
 - Continued roadblock discussions
 - Suggested student survey

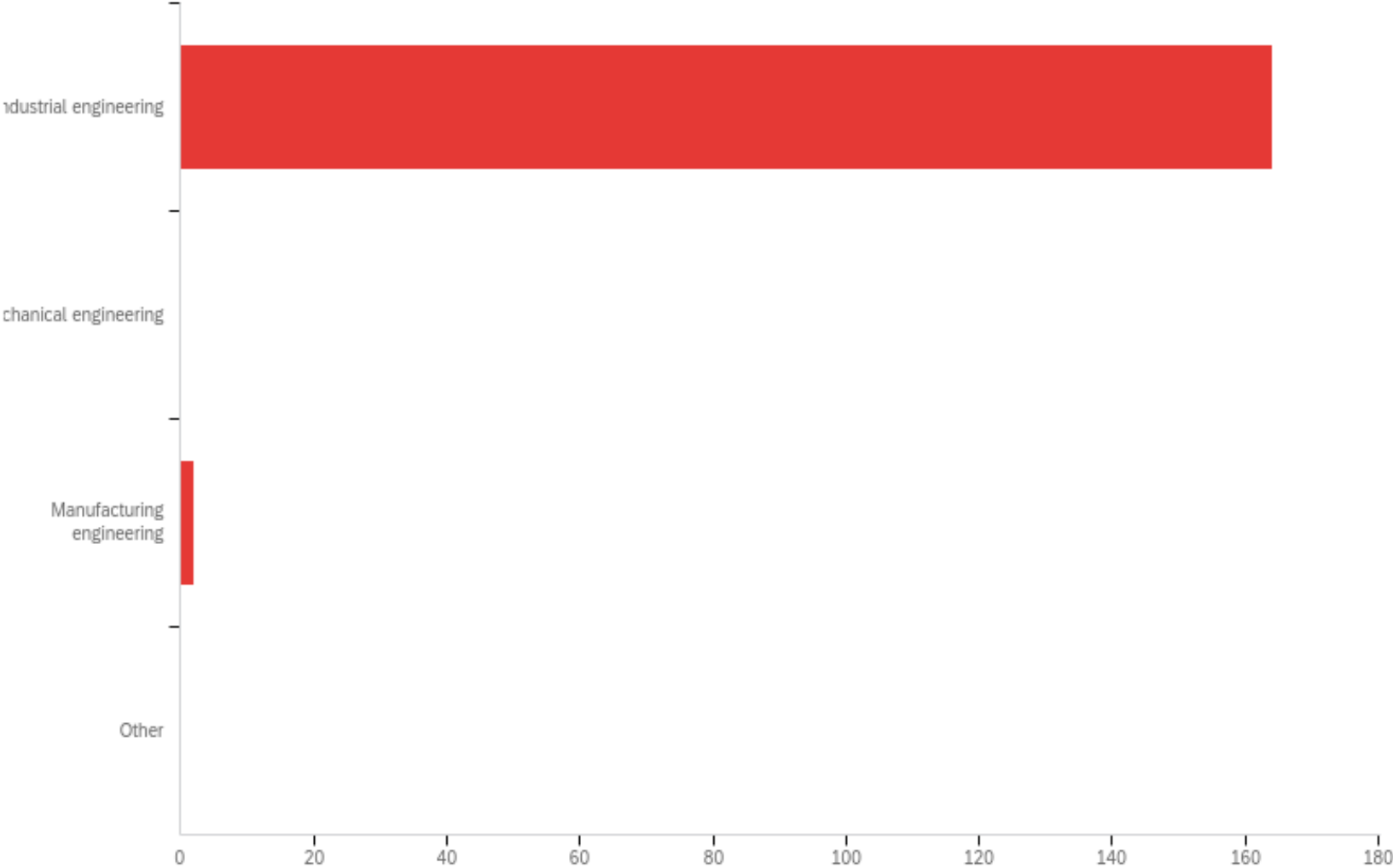
So what did the students think?

- A survey consisting of 26 questions was completed by 170 from 4 universities
- We will go through a quick overview of the responses to the questionnaire

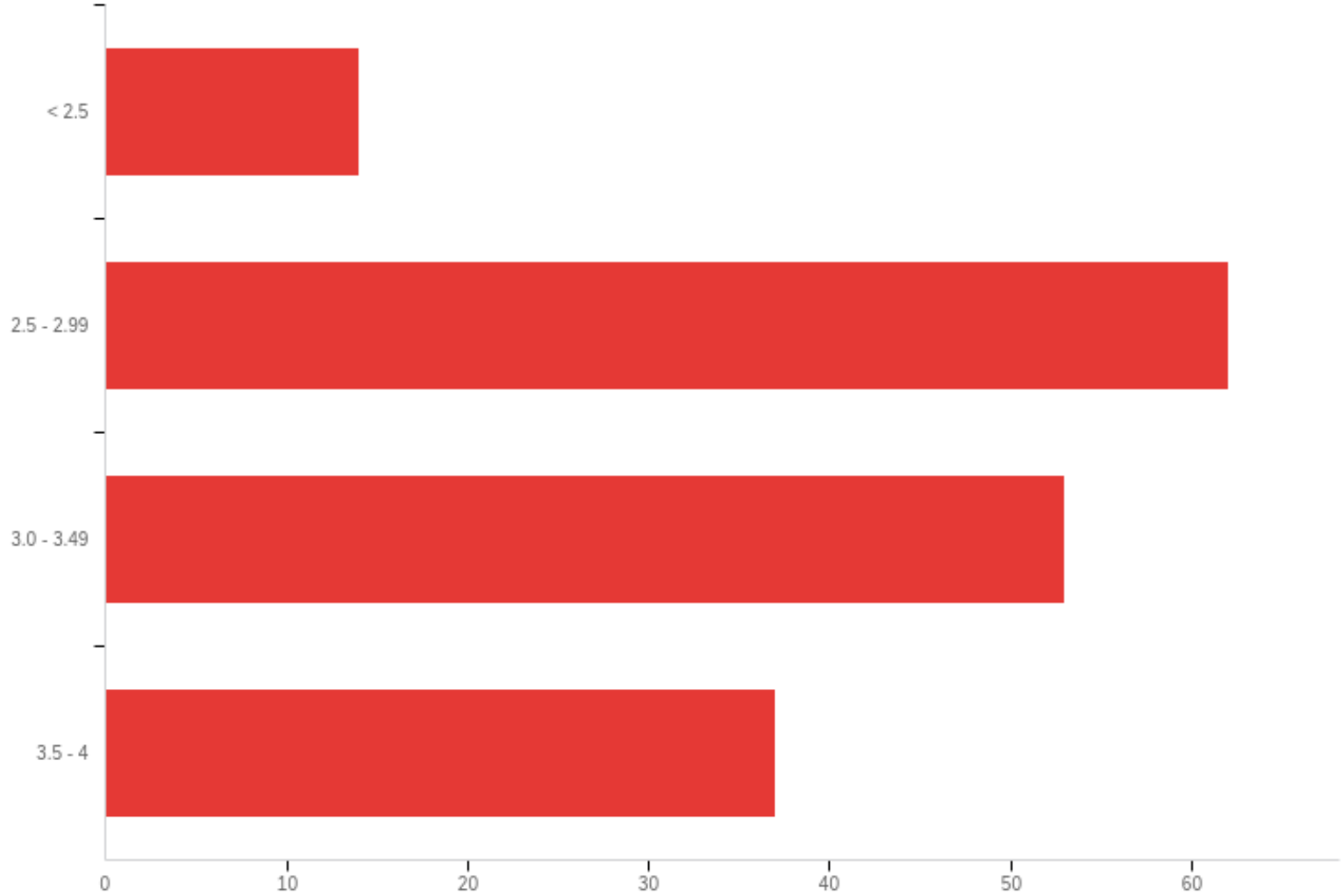
Q2 - Class status:



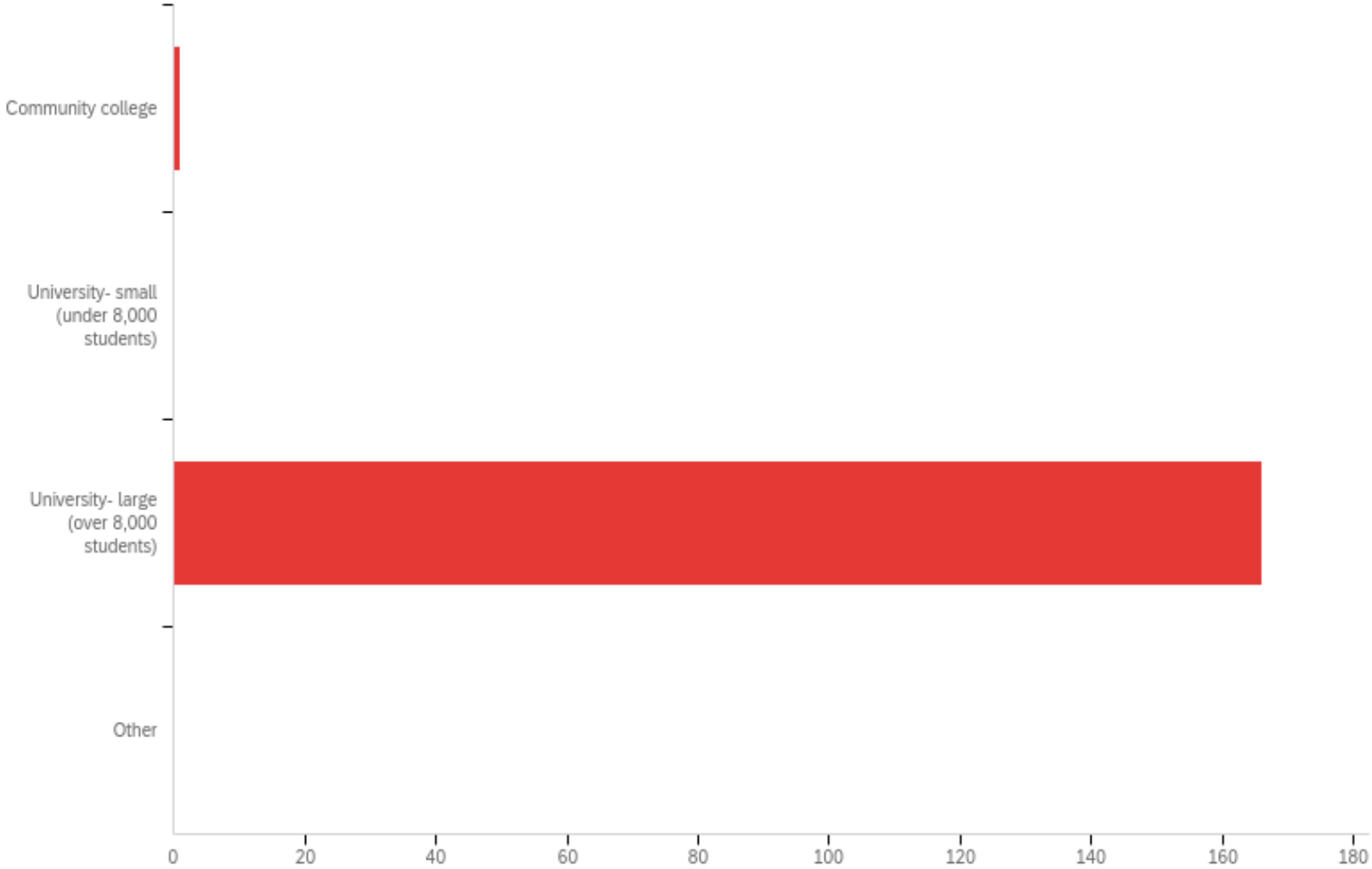
Q3 - Which best describes your major?



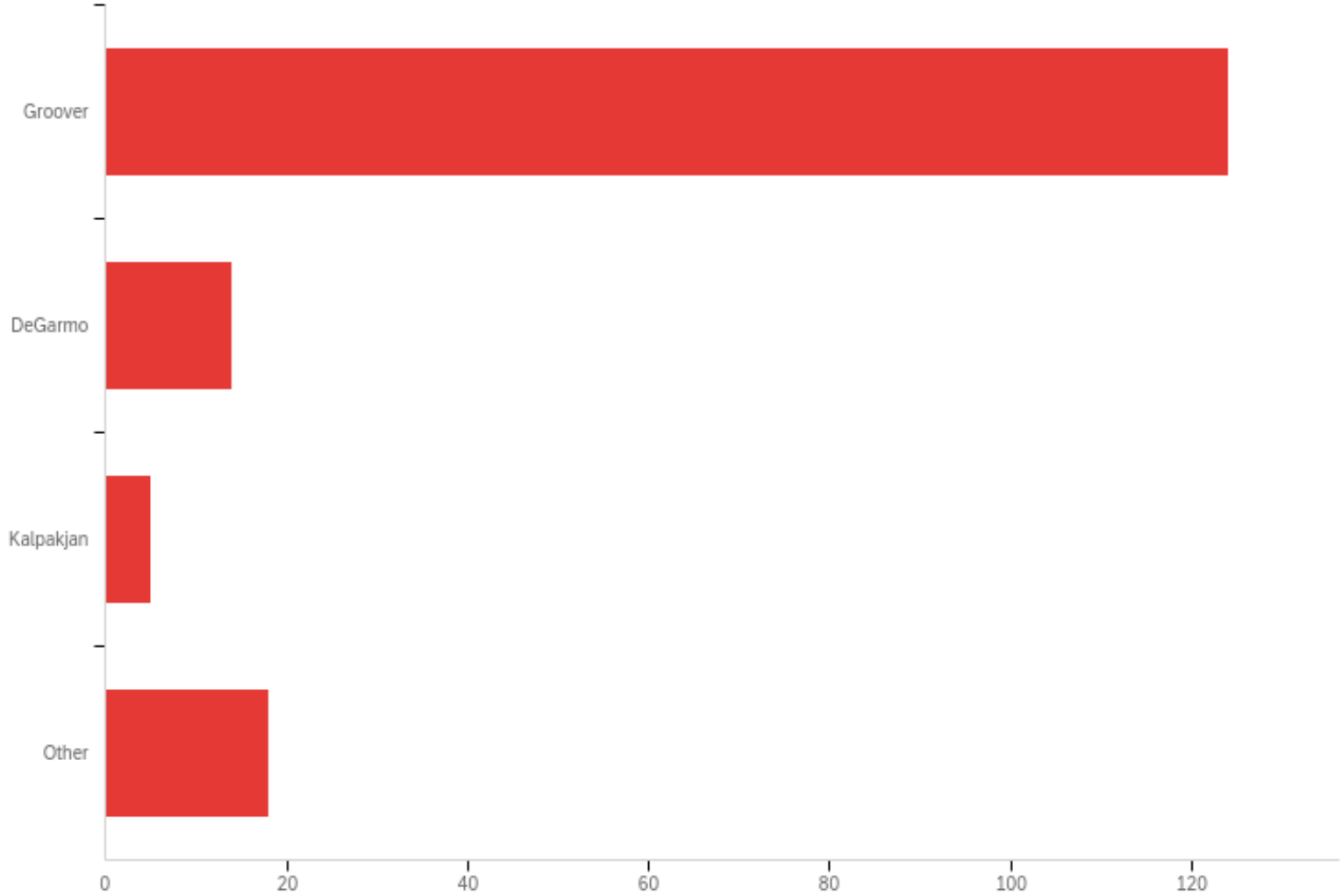
Q4 - What is your GPA?



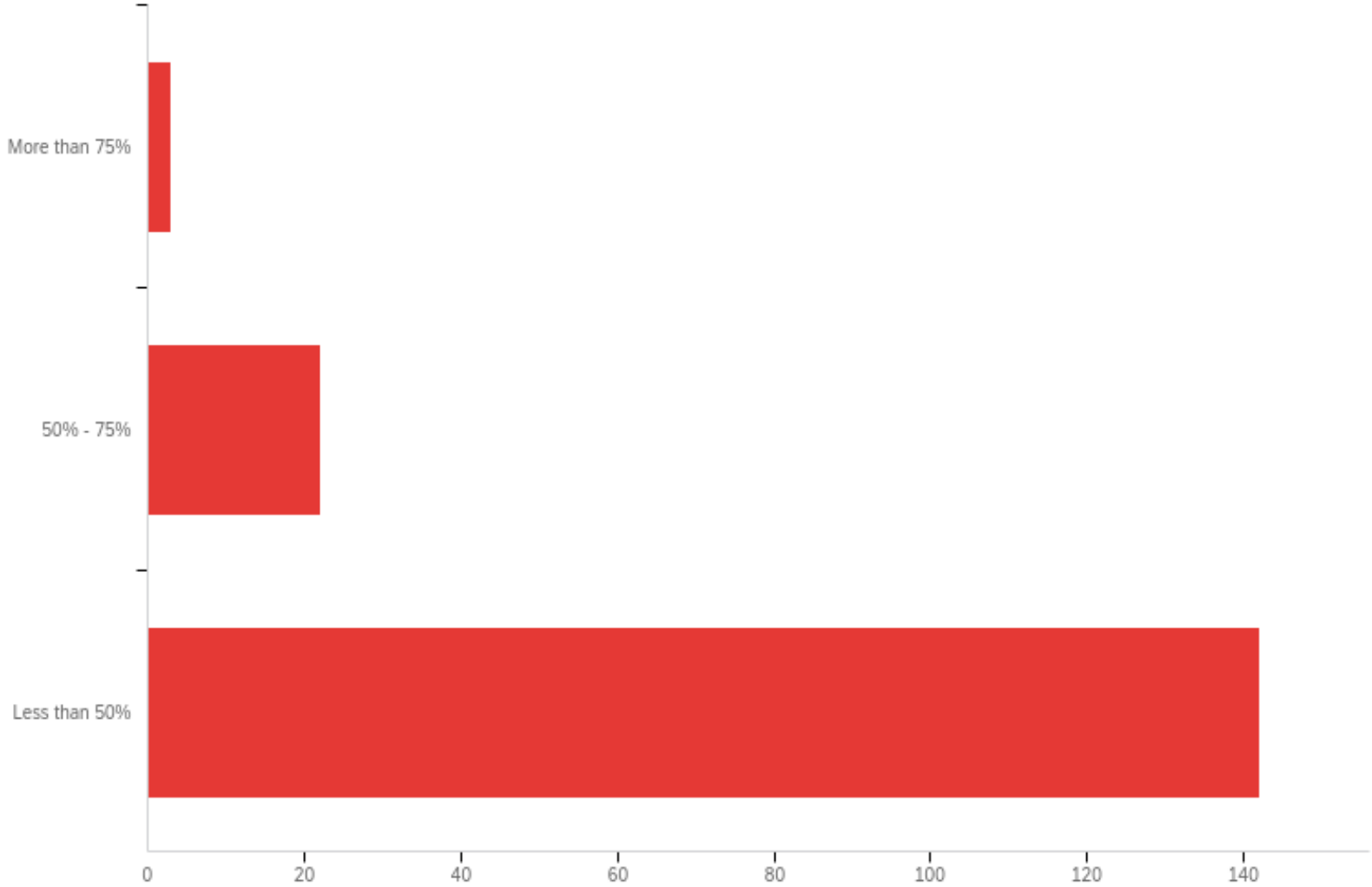
Q6 - Which best describes your college or university?



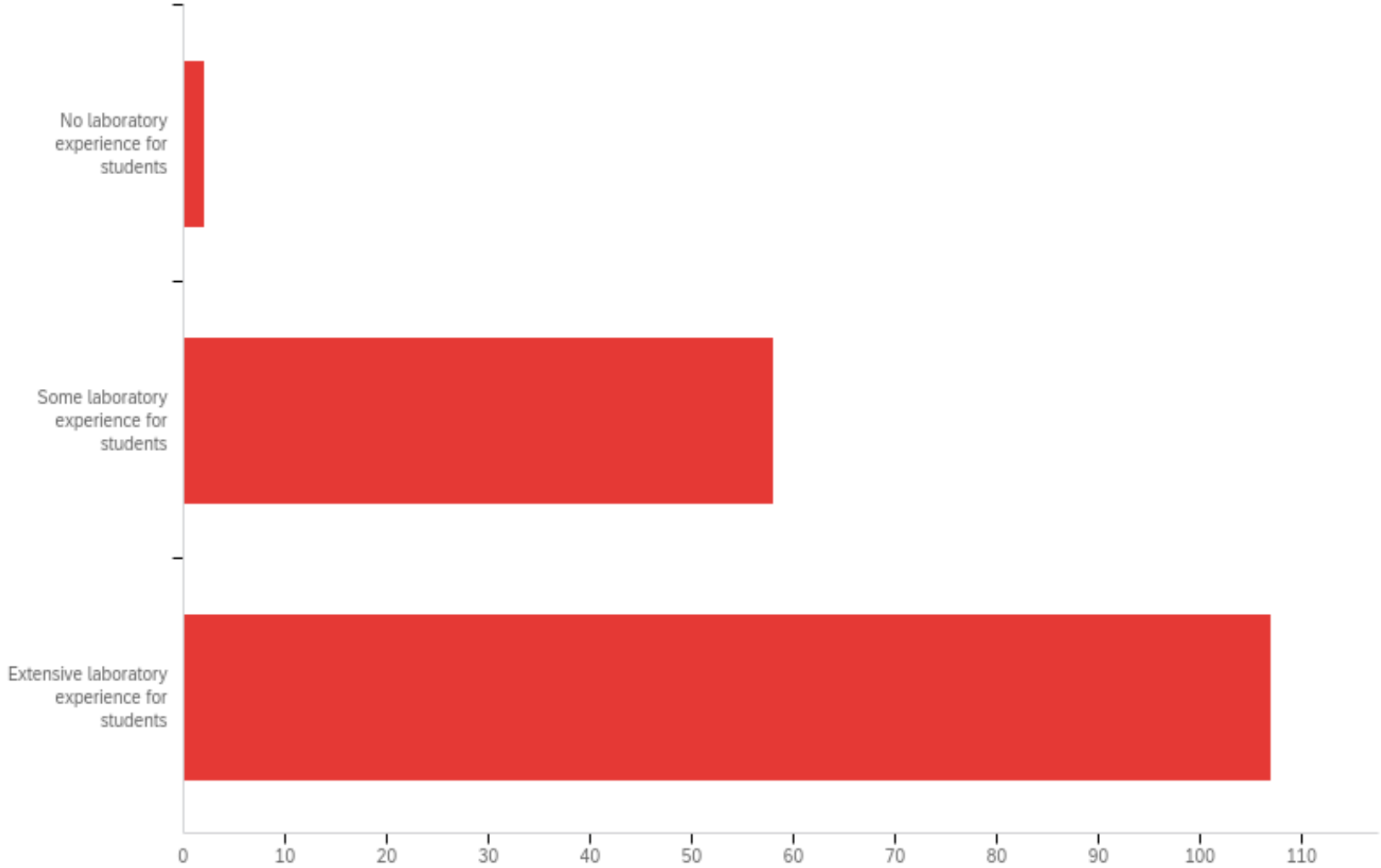
Q7 - I/We currently use the following book to teach manufacturing processes



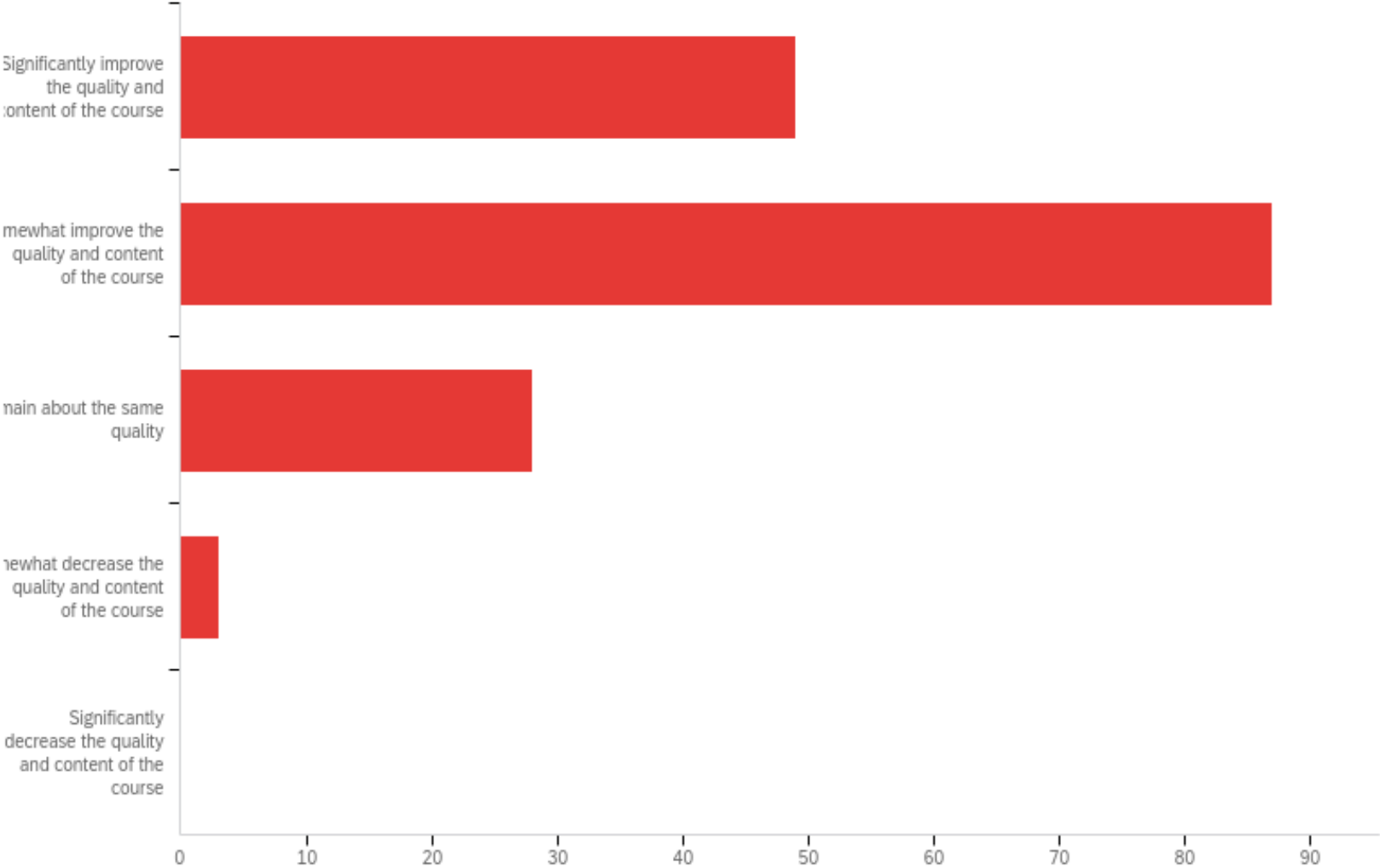
Q26 - What percent of the book, do you currently use/



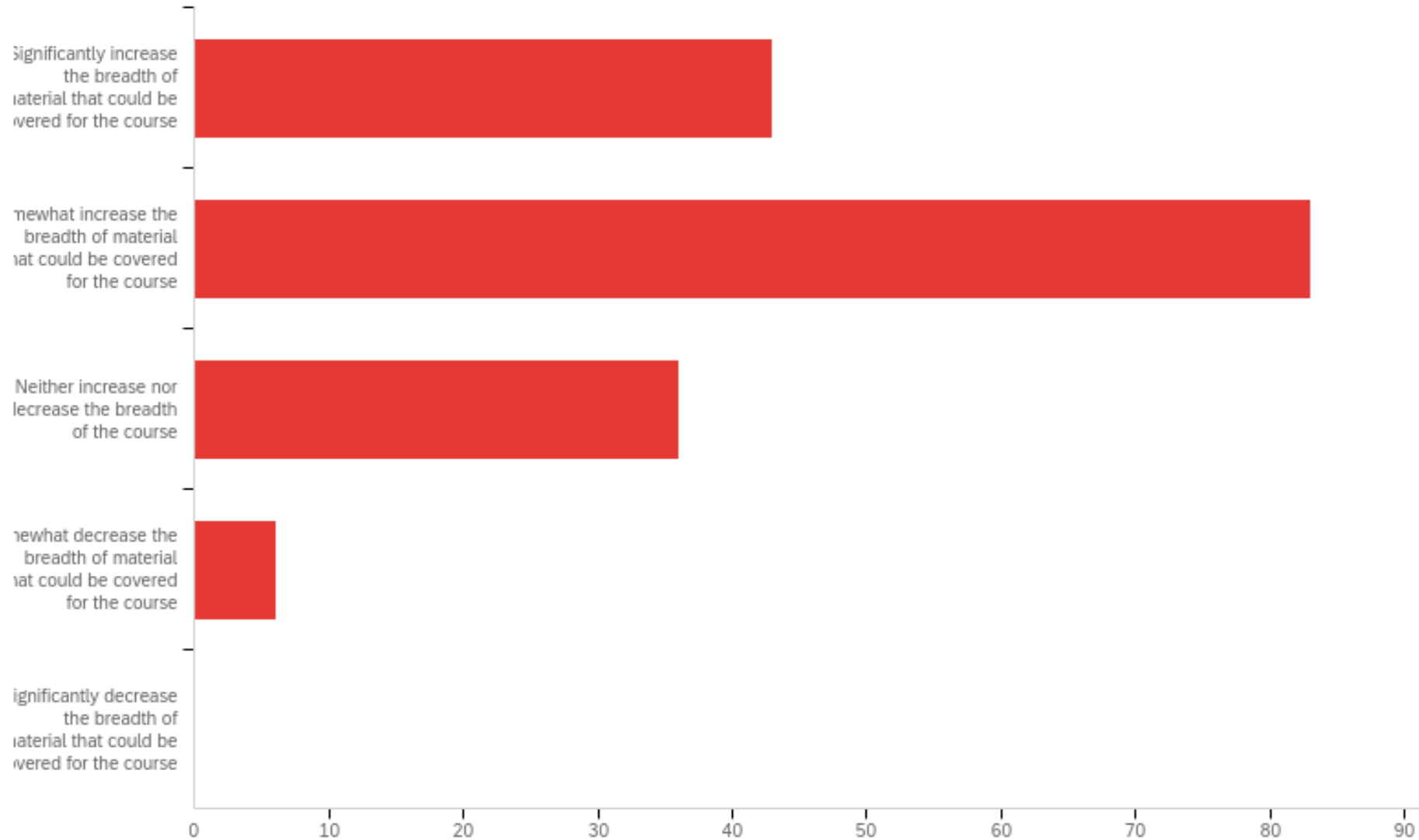
Q8 - The course that I have taken (or am currently taking) has:



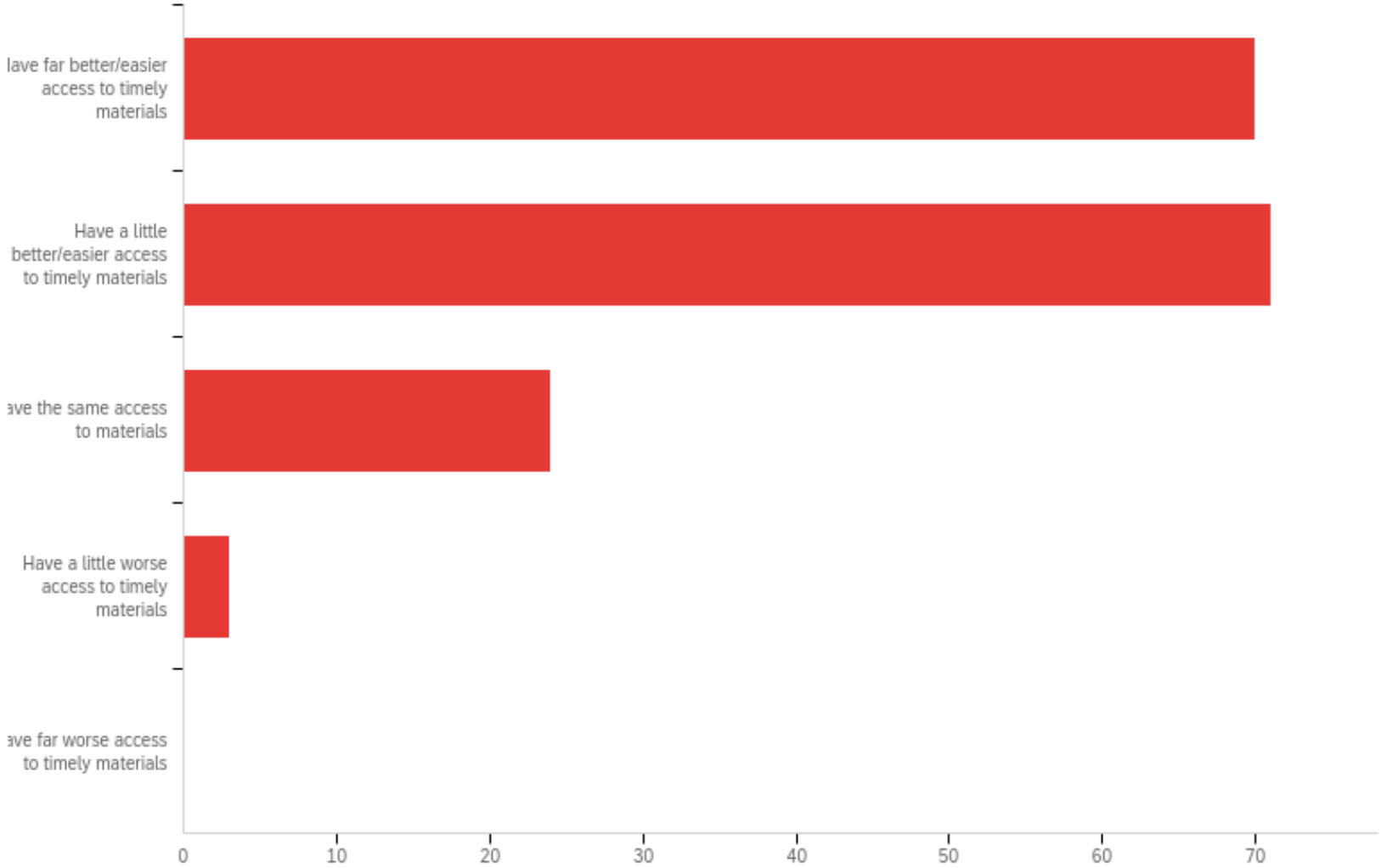
Q10 - If a repository of existing materials for advanced manufacturing was available for university instructors to utilize, it would:



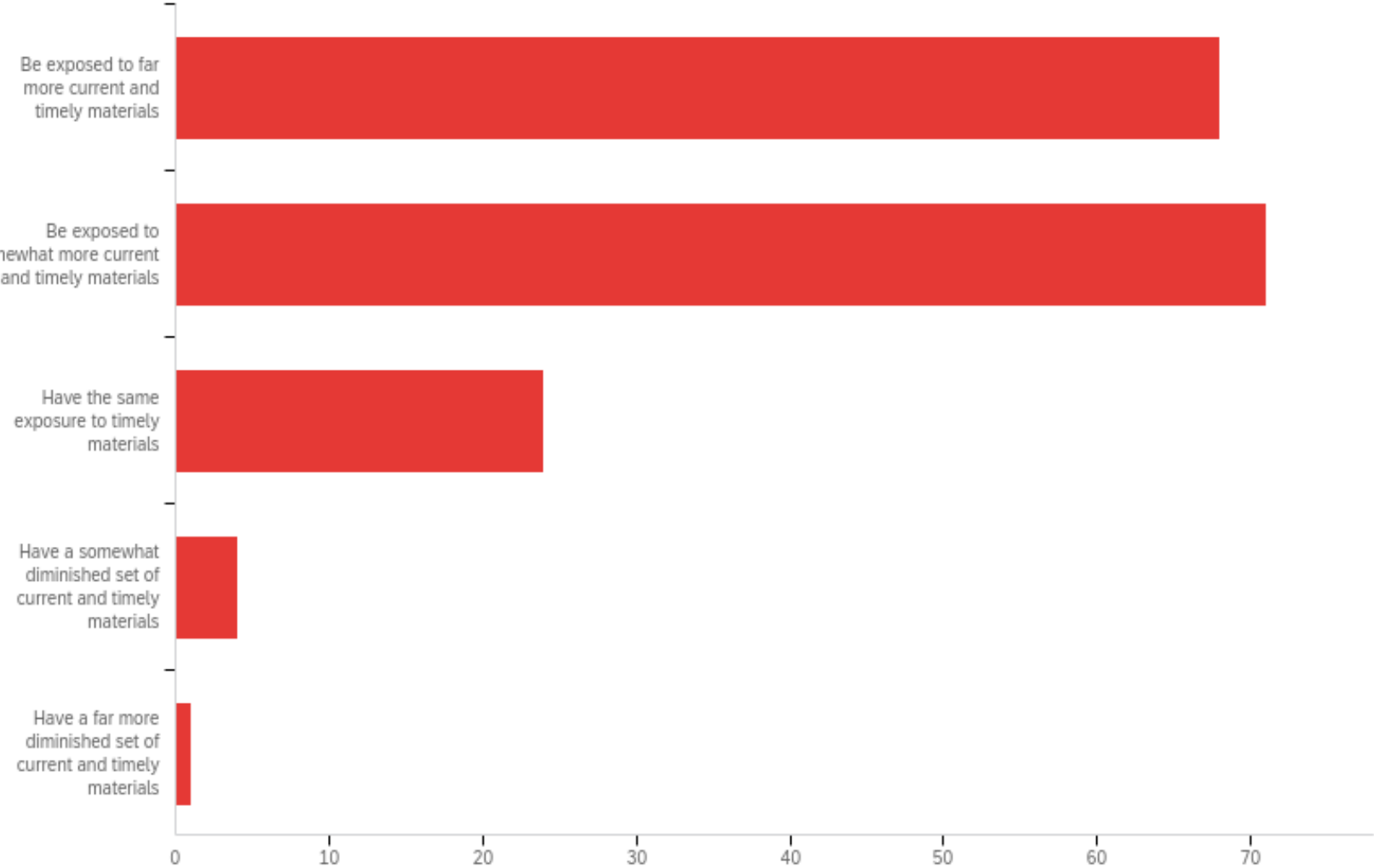
Q12 - If a Repository of existing materials for advanced manufacturing was available for university instructors to utilize, it would:



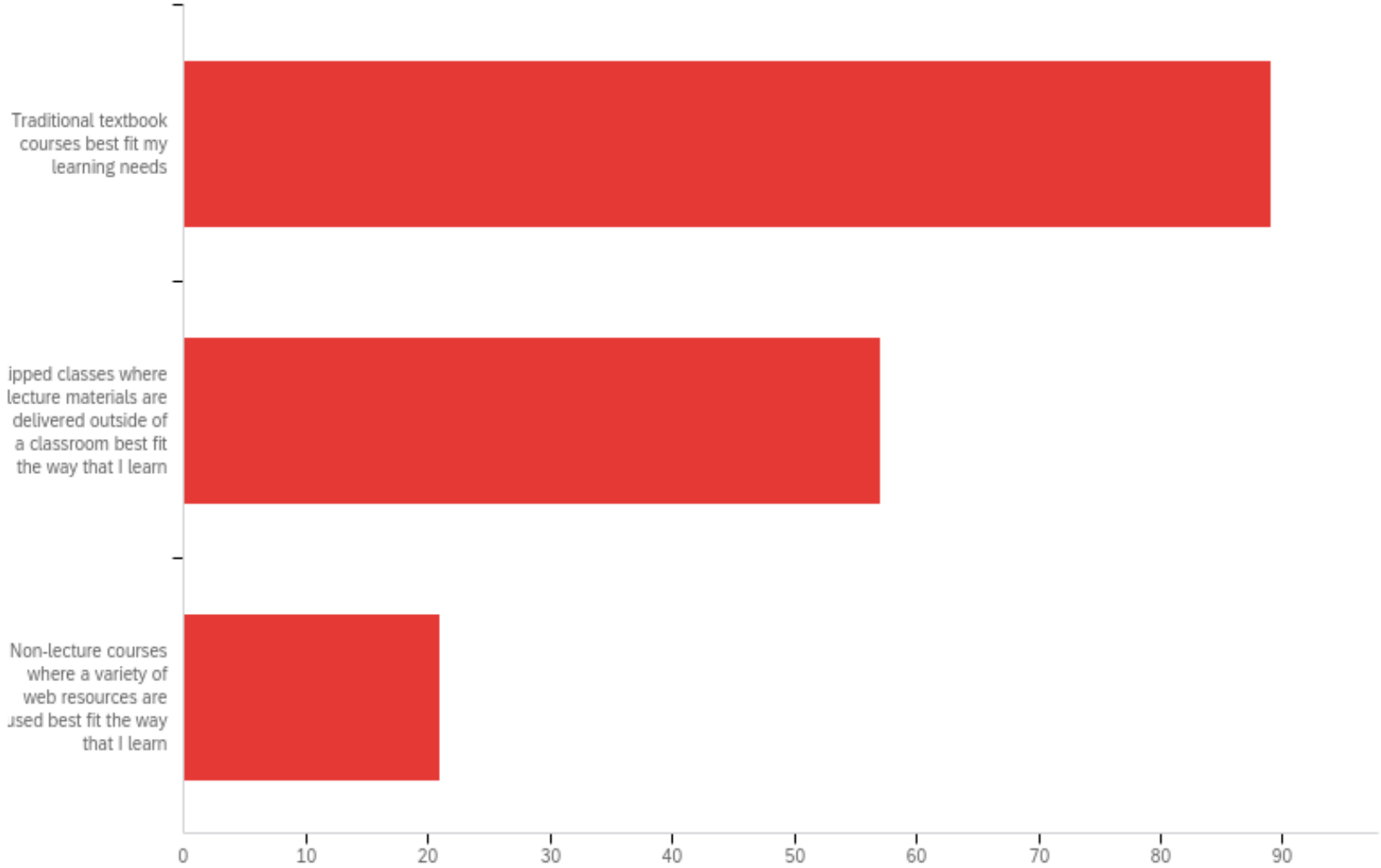
Q14 - Students enrolled in a course that utilizes a repository, will likely:



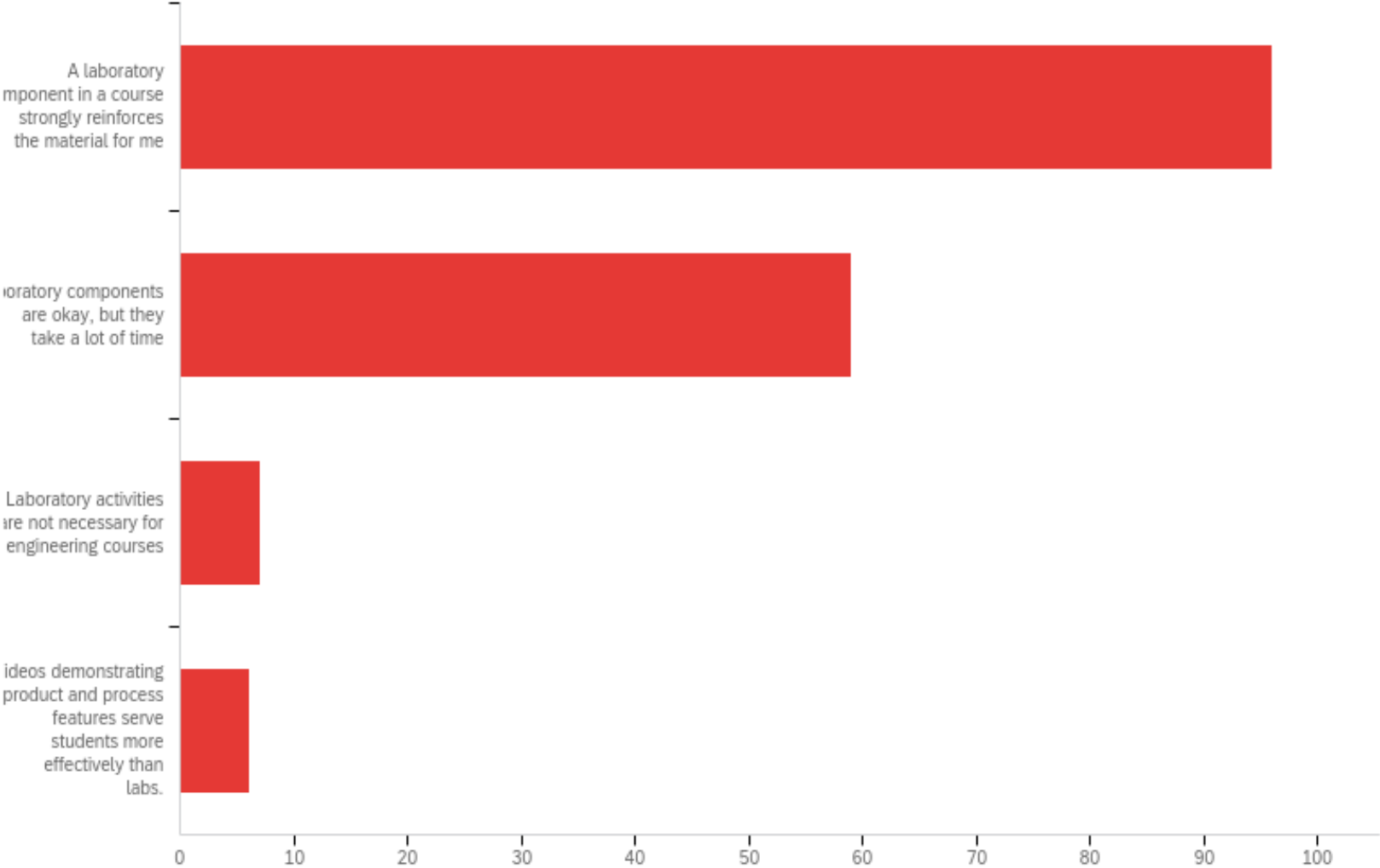
Q15 - Because of frequent updates to a repository, students enrolled in a course that utilizes a repository, will likely:



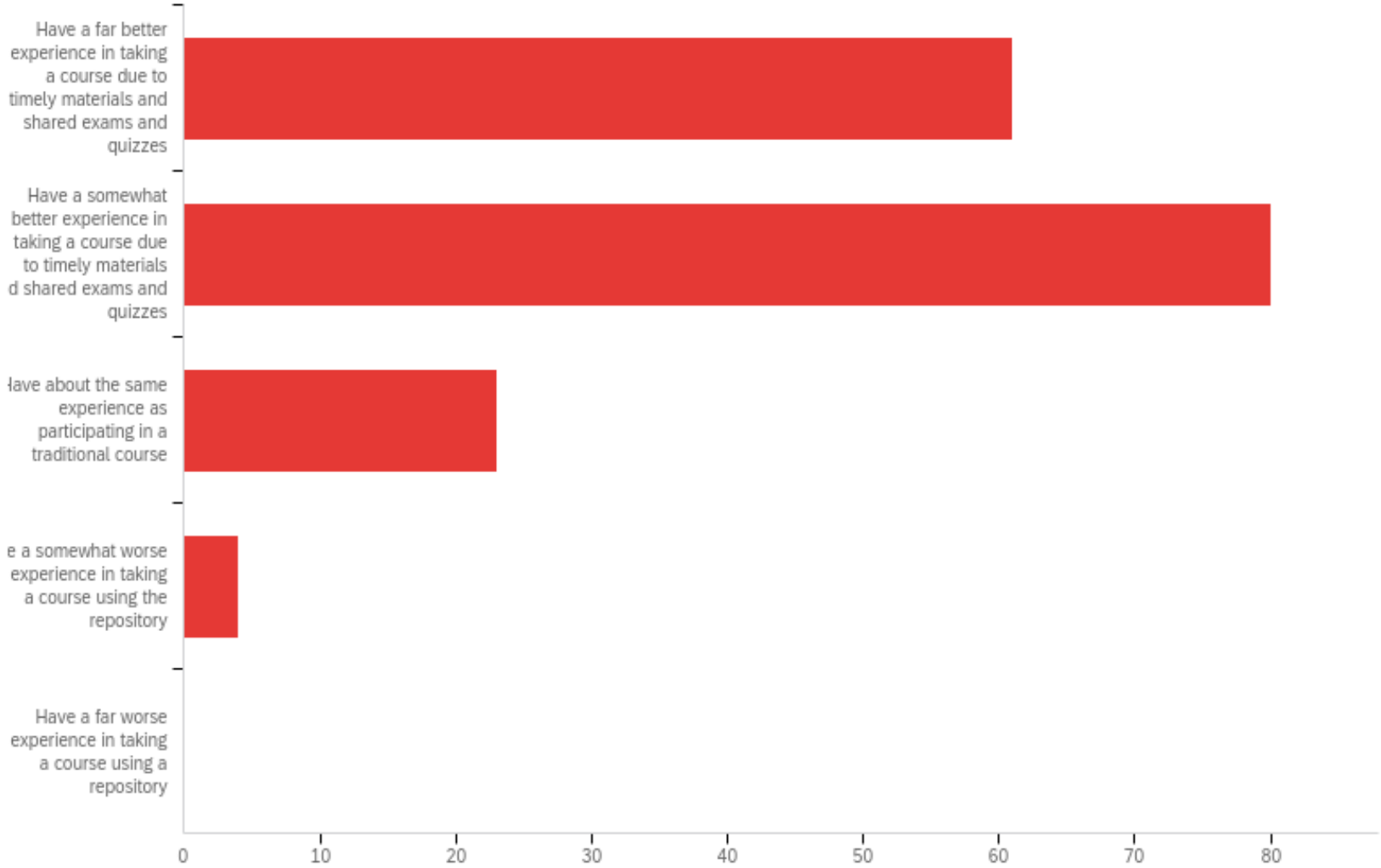
Q16 - As a general rule for engineering courses:



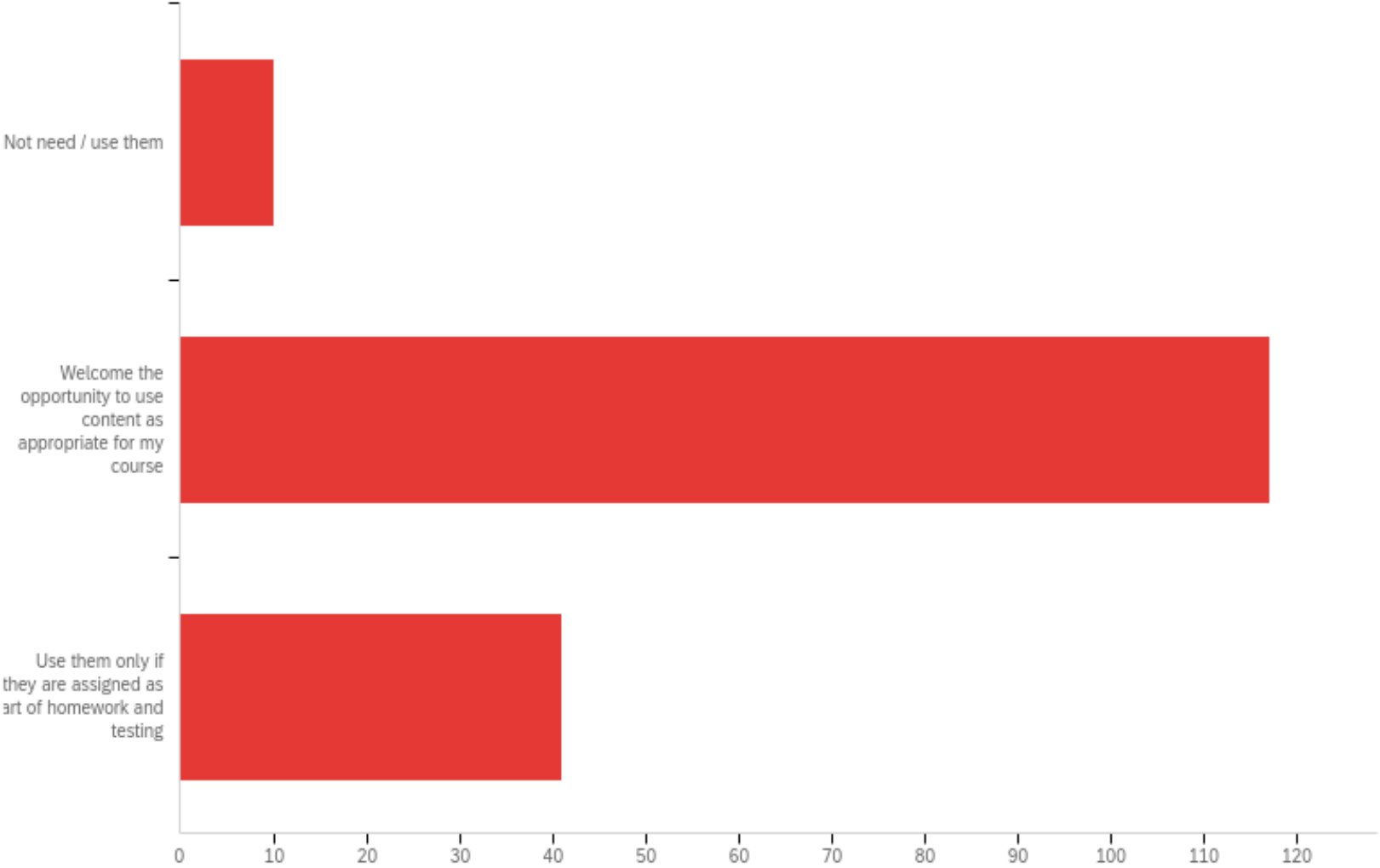
Q17 - For engineering courses:



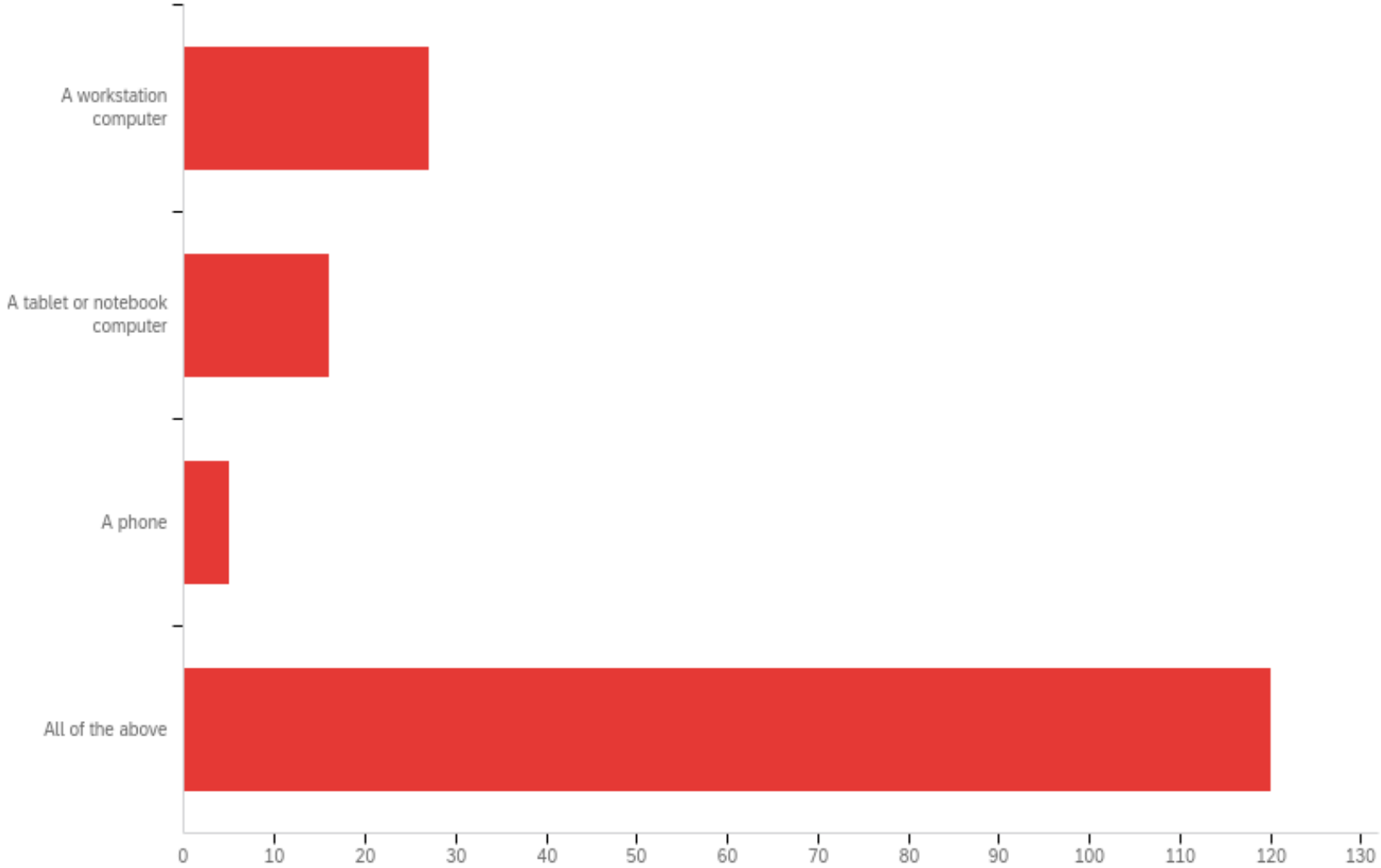
Q18 - Students enrolled in a course that utilizes a repository, will likely:



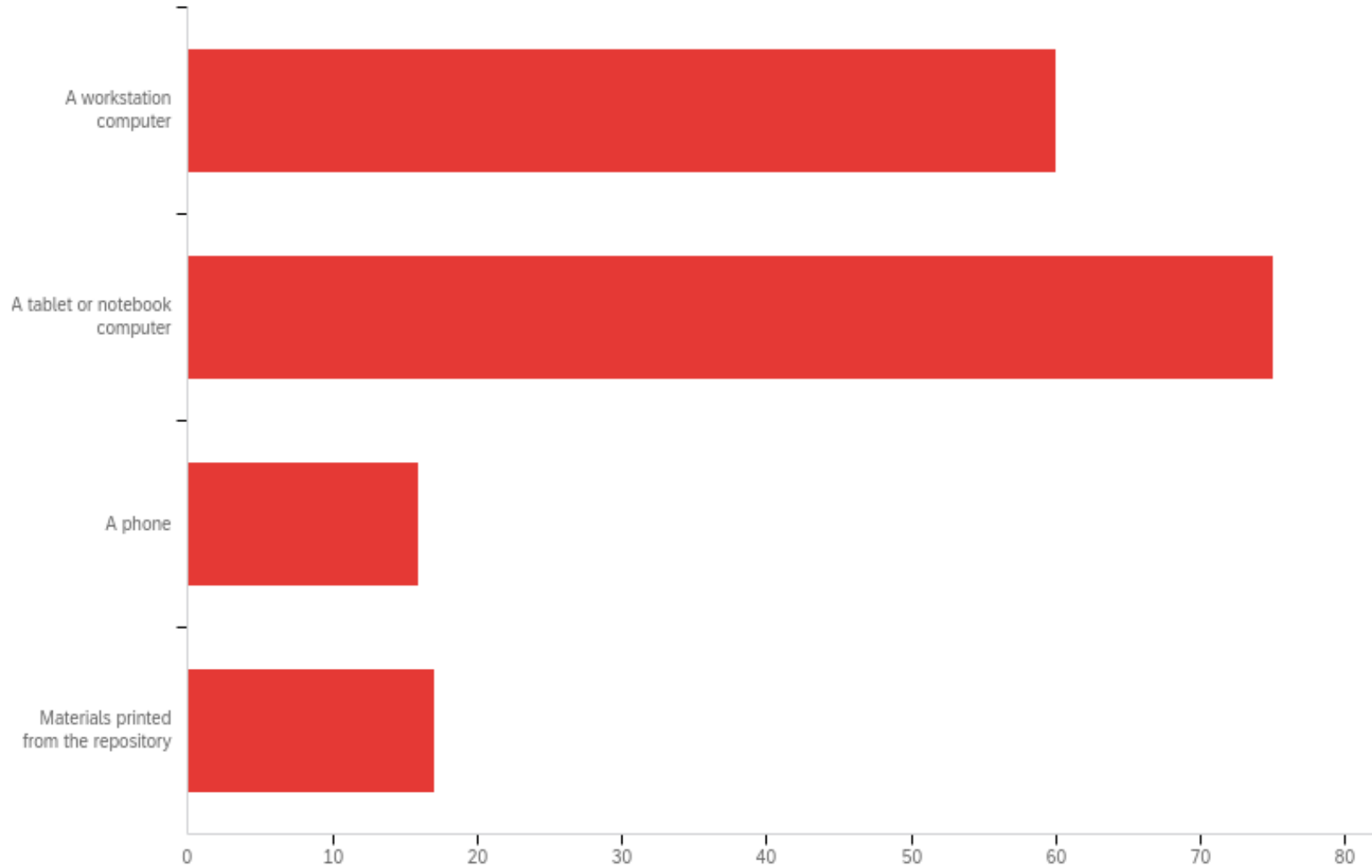
Q19 - If the repository contained videos / data from lab experiments that would illustrate concepts I would:



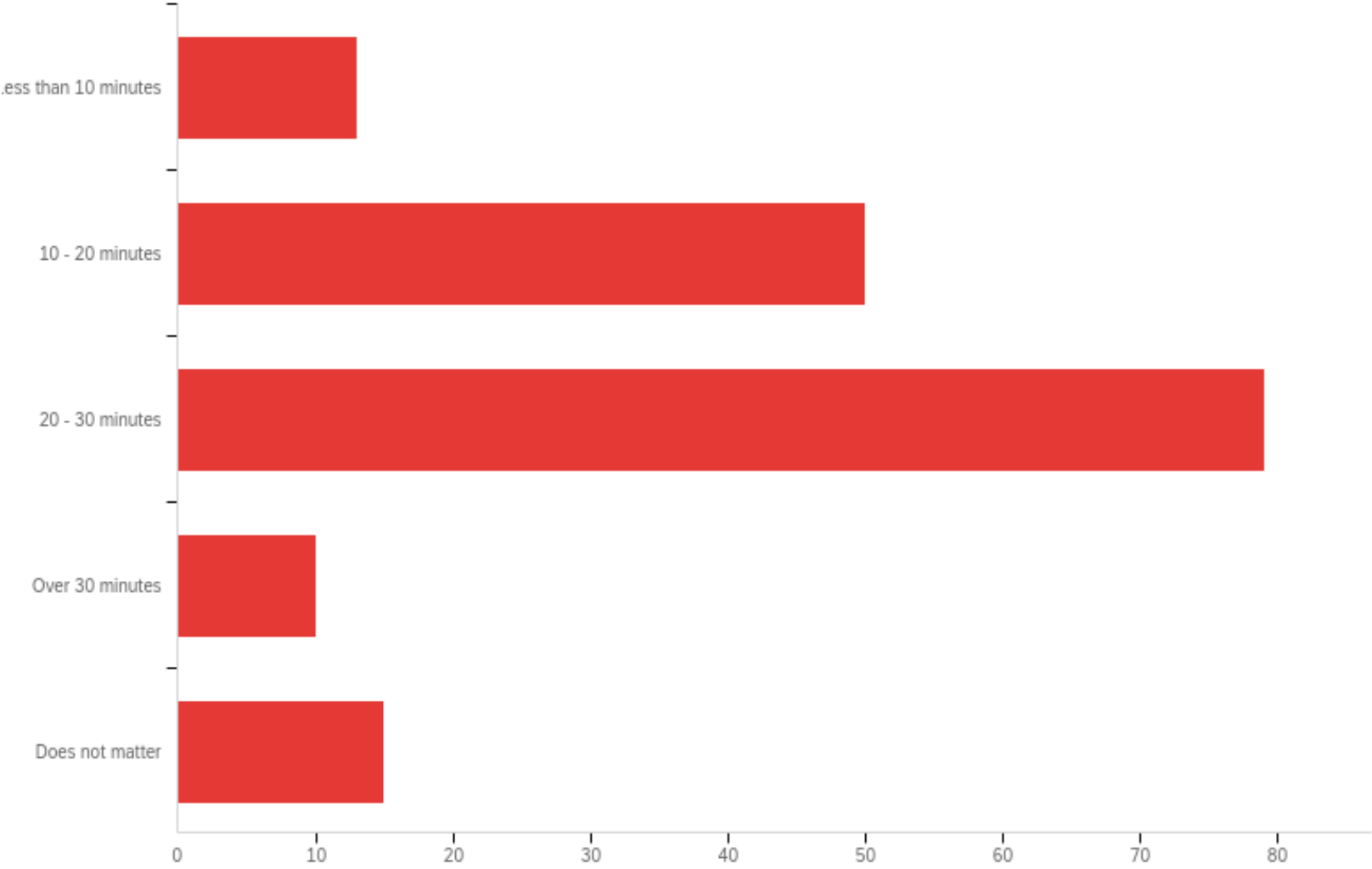
Q20 - The repository should be designed for use primarily on:



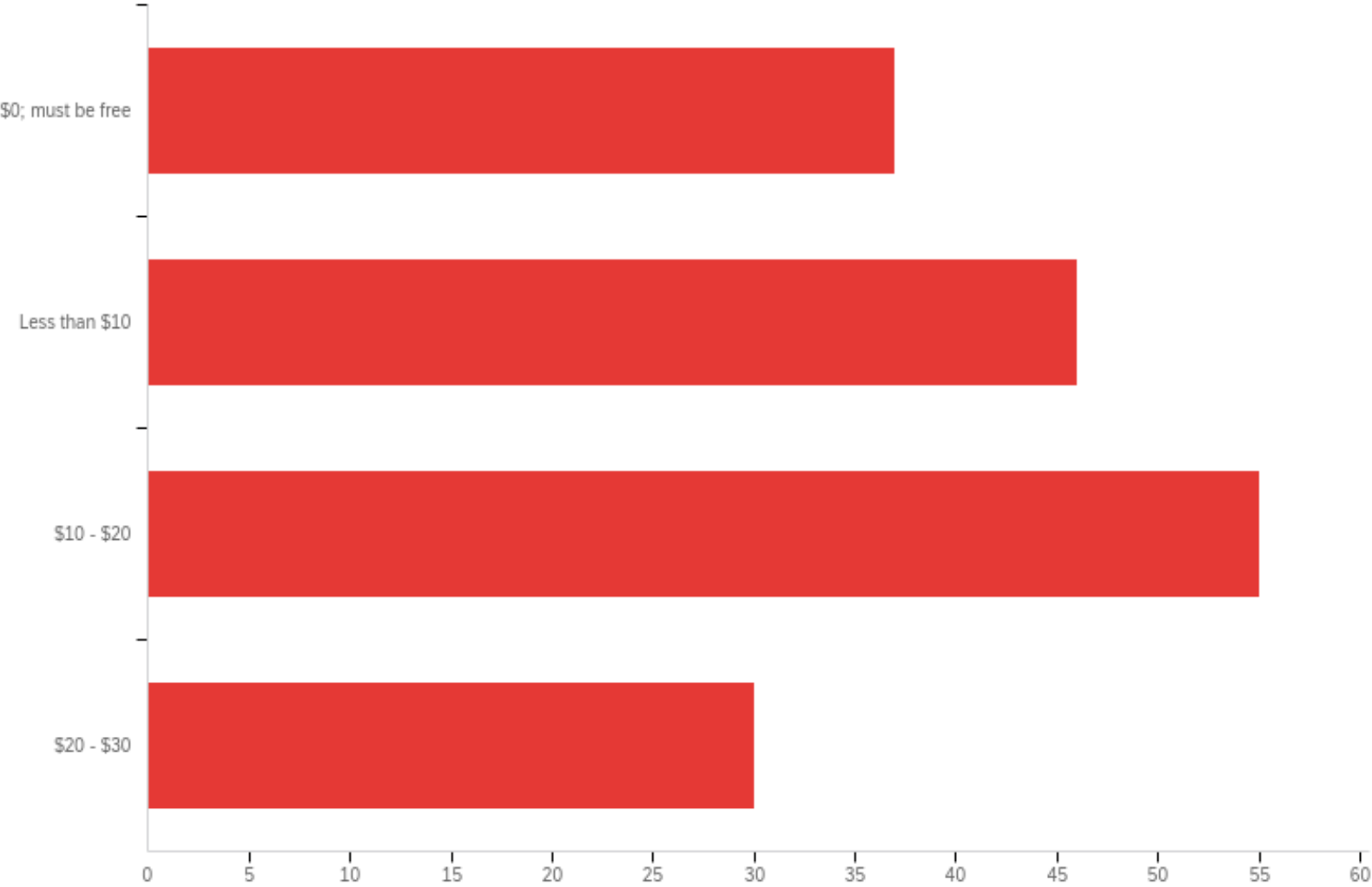
Q22 - In a repository-based course, I would primarily use:



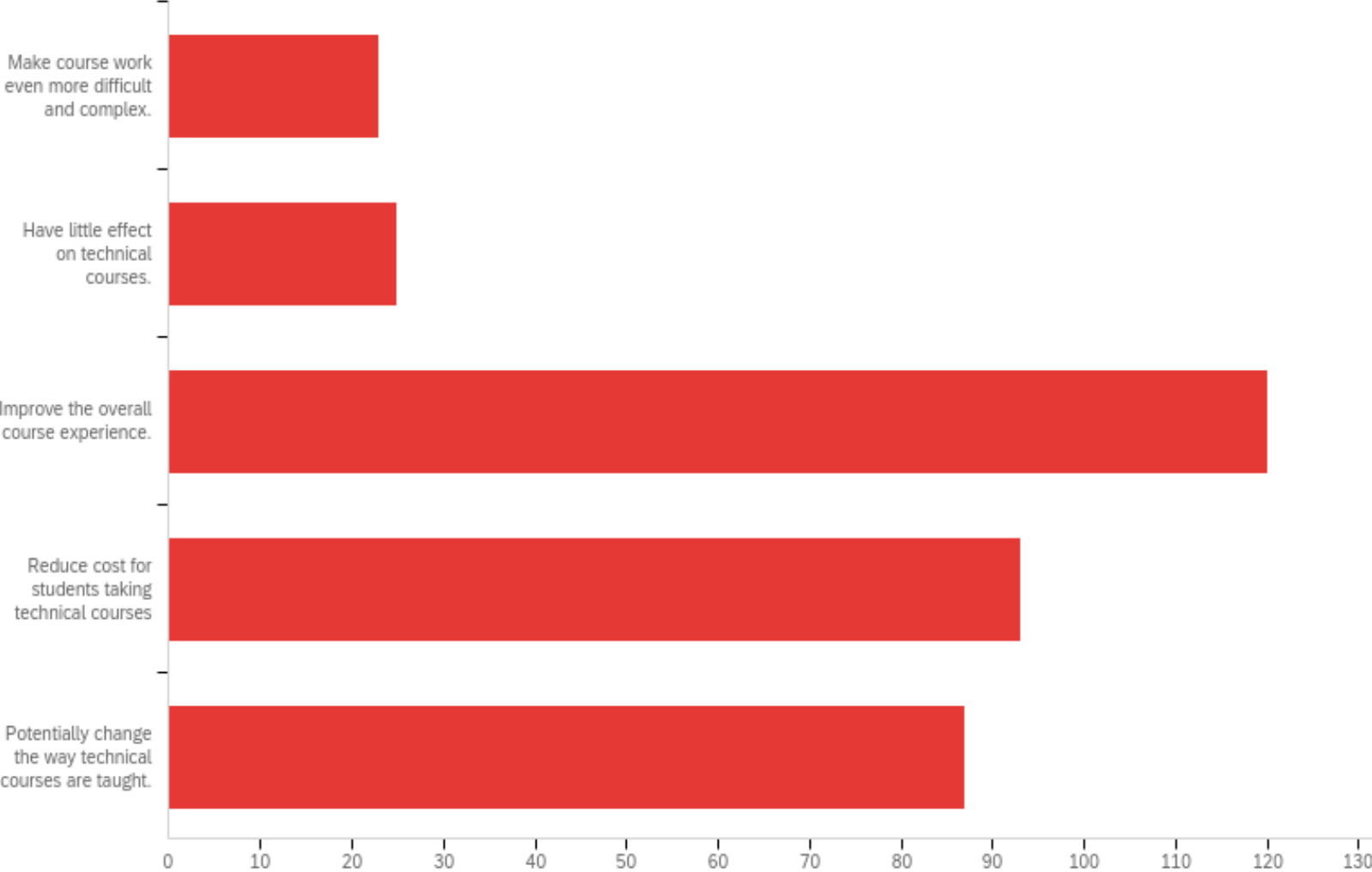
Q21 - I prefer course materials to be broken into small chunks that can be consumed in:



Q23 - I would be willing to pay _____ to use and support the electronic repository if it replaced a book:



Q24 - In my opinion, using a focused technical repository in advanced manufacturing courses will: (pick all that apply)



Student opinions

- Very positive about having a repository
- Like the thought of having learning materials available on multiple platforms
- Feel that the learning experience would be improved
- Like the flexibility of alternative delivery alternatives
- Like the ability to view laboratory component



Faculty survey

- Similar expectations from faculty
 - Concerning the benefits from a repository
 - Save time
 - Enhance breadth
 - Lower cost to students
 - Concerning participating in a repository
 - Virtually all respondents would look using it based on expected utility
 - Concerning contributing to a repository
 - Most seem interested
 - How do faculty get credit?
 - How do they protect IP?

Back to SLAM progress

- Learned about student and faculty opinions
- A lot of enthusiasm concerning SLAM
- How do we make this happen?
- Overcoming roadblocks



Major hurdle – sharing IP and getting credit for contributing material to STAM

- Open Education
- OERCommons.org
- CreativeCommons.org
- We are working with William Cross and Michah Vandergraft who are participants in the National Open Education project
- Different ways to overcome these issues
 - MedEd uses a Journal to review and publish many of their clinical innovations
 - LearnChemE awards faculty with contract money to prepare site materials

Brief update

- Uncovered two similarly focused activities
 - MedEd supported by the American College of Physicians and many others.
 - <https://onlinemeded.org/spa/our-story>
 - This site has a similar focus for what we have talked about for STAM, but focuses on medical studies and more specifically clinical practices. Uncovered two similarly focused activities
 - LearnChemEng focuses on foundational topics for Chemical Engineering and has been supported by NSF and others
 - <http://www.learncheme.com/> .
 - This website focuses on foundational methods of Chemical engineering and creating a HELP ENVIRONMENT for students and instructors in ChemEng.



Our Story

Med school sucked. Information was needlessly overworked and extraneous, materials were expensive, and the sources were disjointed and scattered. We got the job done and did well, but knew there had to be a better way. We had the knowledge, skill and scores to do it. So we went to work; we got a white board, a camera, and started making videos. It worked. People used it. People LIKED it. Our interest is in making

Our mission is to change how medical education is approached, how medical schools deliver it and how students learn it.

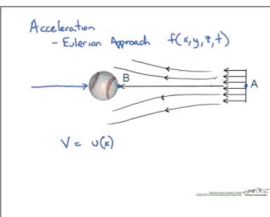
LearnChemE

Educational Resources for Chemical Engineering
Department of Chemical and Biological Engineering
University of Colorado Boulder



- Home
- Screencasts
- Simulations
- Quiz Yourself
- Virtual Labs
- Student Resources
- Instructor Resources
- About/Contact Us

See webinar on [Chemical Engineering Online Learning](#)



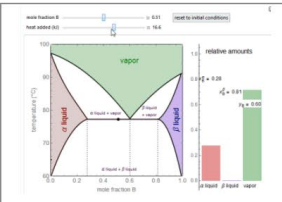
Screencasts

More than 1,700 screencasts, which are short screen captures of a tablet PC with narration. They include example problem solutions, explanations of concepts, software tutorials, introduction to topics, diagram descriptions, and reviews.



Interactive Self-Study Modules

More than 50 modules; most include: introduction, ConcepTests, introductory screencasts, important equations, interactive simulations, quiz-yourself simulations, example problem screencasts, and key points.



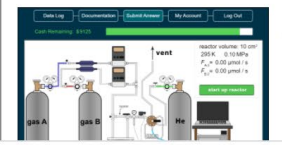
Interactive Simulations

More than 200 chemical engineering simulations that allow the user to determine how system behavior changes when variables are changed.



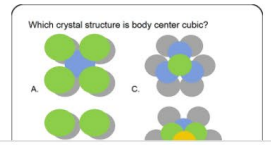
Step-by-Step Interactive Simulations

More than 20 simulations that use a step-by-step procedure in which the user inputs an answer, and then checks the "solution box" to see the correct answer. These simulations are useful for thermodynamics, separations, and/or material and energy balances courses.



Virtual Chemical Engineering Laboratories

Two virtual laboratories (VLs) are currently available and another will be available soon. In these VLs, students can plan



Instructor Resources

More than 1900 ConcepTests, which are conceptual questions that can be used with peer instruction. Three OneNote-based

SLAM Repository



Welcome to The Shared Learning materials for Advanced Manufacturing (SLAM)

The goal of SLAM is to develop a flexible learning repository for creating flexible teaching environments. The repository will contain modular educational materials for manufacturing instruction to be used by multiple educators, where each instructor retrieves text and video components for specific topics along with other course material specifically related to his/her course. A typical technology instructor will modify and embellish these materials to meet their individual instructional needs. The difference is that the instructor then redeposits these materials back into the repository to create "organic educational materials" that grow and are enriched over time by use for ATM instruction.

[Help](#)

Show all X

A National or Regional consortium

- We have identified 7 AMT areas
 - Traditional Manufacturing Methods (Wysk and Cohen)
 - Foundry Methods (Voigt and Lynch)
 - Additive Manufacturing Methods (Harrysson and Timmer)
 - Hybrid Manufacturing (Manogharan and Wuest)
 - Design for Production (Kremer)
 - Composites Engineering (Liang and Okoli)
 - Manufacturing Control (King).

Summary of where we are and where we're going

- Have got a lot to show for the initial workshop proposal
- Lots of excitement from the *Community of AMT Instructors*
- Good timing (COVID)
- Would like to move forward with a: 1) NSF IUSE Institutional and Community Transformation proposal. We seek to unite multiple universities utilizing a teaching repository (Level 2 award up to \$3M) that will create a shared platform for creating and using traditional and new technological materials or 2) NST Institutional and Community Transformation proposal Phase I (up to \$300K)

Questions!?!

