



Evaluating the Gap Between Training Programs and Hospitals in Medical Laboratory Science Chemistry Testing

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ABSTRACT

The purpose of this paper is to establish what differences exist between students enrolled in Medical Laboratory Science programs learning about Chemistry and actual working Medical Laboratory Scientists at hospitals performing Clinical Chemistry. One of the problems faced in any trade school is the disconnect between an artificial (or a student) experience, and the actual experience of a work environment. This research focuses specifically on Clinical Chemistry among training programs and hospitals in the state of Utah. All university training programs in the state were included, and hospitals were chosen based on size and location. Two types of surveys were written and distributed: one for hospitals and one for training programs. The results indicate that approximately 50% of training programs use outdated instruments and testing methods. Despite this gap, and perhaps most importantly, there appears to be little correlation to the quality of instrumentation used in an educational program and the preparedness of students to work in Clinical Chemistry. In addition, despite program limitations, various ideas are proposed that programs can implement to improve and better prepare their students for a career in Medical Laboratory Science.

INTRODUCTION

The major purpose of Medical Laboratory Science programs is to prepare students to enter the workforce as Medical Laboratory Scientists and Medical Laboratory Technicians. Regarding Clinical Chemistry, some training programs have purchased larger instruments comparable to hospital laboratories while others, because of monetary and practical limitations, use equipment no longer used in the actual workforce. This is generally seen in the form of small spectrophotometers that are relatively inexpensive. Hospital laboratories use large automated instruments which, in our particular study, were exclusively the Architect series. Two questions were posed. One, do these limitations impact student preparedness for the current workforce? And two, are students that attend training programs with modern equipment more prepared than those that attend those without? This study was designed to address these questions and to discover if a gap exists between training programs and hospital laboratories. Furthermore, if there is a gap, does it affect whether students are adequately prepared to work in Clinical Chemistry?

METHODS and RESULTS

Two surveys were created through Qualtrics survey software. One was sent to 17 different hospitals and the other to the 4 MLS programs in the state of Utah. The hospital survey asked questions about the preparedness of graduates from different universities. Although subjective, this helped give an idea of differences that exist between the universities; specifically, it compared those universities with minimal instrumentation in their clinical chemistry course to those with large chemistry analyzers. The MLS program survey asked questions about instrumentation, teaching methodologies, and clinical rotations.

Pertinent MLS Program Survey Questions:

- Does your program include teaching about current instruments used in hospital labs?

Yes	No
25%	75%

- Does your program provide an internship for students?

Yes	No
100%	0%

- Rank what you feel hospital or other laboratories look for in recent graduates related to Chemistry training.

Rank Topic	Points
Understanding QC Procedures	17
Science behind the procedures	13
Common mistakes of recent graduates	11
Other	11
Being familiar with current Chemistry instruments	8

Tables 1-3 – Table 1 indicates that most programs do not dedicate time to learning about new instrumentation. Table 2 shows that every program provides an internship for their students. Table 3 was designed using a point system (i.e. Ranking a topic as the top choice received 4 points. Ranking it as the second choice received 3 points, etc.) Overall, it reveals that MLS instructors feel that an understanding of QC is an important area of chemistry training.

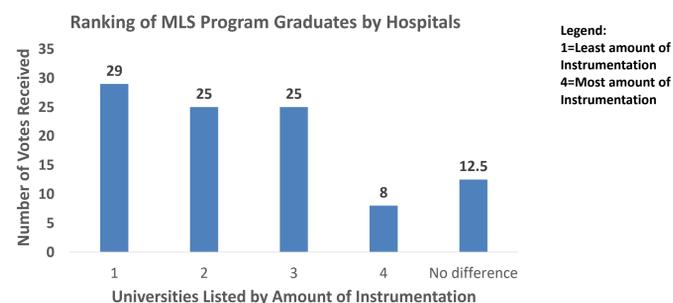


Figure 1 – University Ranking Comparison. Figure 1 rankings were created using the same ranking system used in Table 3. Rankings by hospitals indicate that there is little to no correlation to how much instrumentation a university has and the preparedness of their respective students. In fact, the universities with the less instrumentation received slightly higher scores than those with the more instrumentation. Importantly, 12.5% of respondents felt that there was no difference in the chemistry skills of recent graduates from the four different universities.

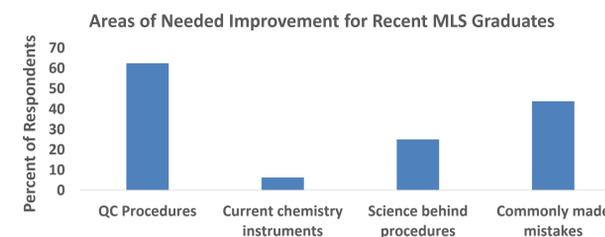


Figure 2 – Hospital Expectations. Of the options available, QC procedures received the overwhelming majority of areas of needed improvement. It appears though, that program instructors are, at least somewhat, aware of this need (see table 3).

Additional Hospital Survey Information:

- Do current Chemistry courses provide sufficient technical skill to the work bench?

Yes	No
79%	21%

- Do current Chemistry courses provide sufficient scientific knowledge to work the bench?

Yes	No
100%	0%

- Tables 4-5 – Table 4 shows that the majority of hospitals feel that new graduates are technically prepared. Table 5 shows that hospital respondents feel that students have sufficient scientific background to work the bench.

CONCLUSIONS

Our data confirms that 50% of the MLS programs in Utah teach clinical chemistry using techniques that are not widely used in hospital laboratories. However, Figure 1 shows that the lack of instrumentation appears to have no effect on student preparedness to work the bench. In addition, Tables 4 & 5 reveal that the vast majority of hospitals feel that new graduates are sufficiently prepared to work the bench. We propose that the internships provided by training programs (Table 2) fill the gap of outdated equipment. This revealing information suggests that training programs do not need high-tech instruments to successfully prepare their students for the workforce. However, based on our survey results, an increased focus on QC procedures would be beneficial for preparing students to enter the workforce.