J of Nuclear Medicine Technology, first published online June 30, 2022 as doi:10.2967/jnmt.122.263904

Building Program Efficiencies Utilizing JRCNMT Compliance Forms

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Word Count: 3754

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Abstract:

In the past, program assessment had been considered a supplemental activity that was designed to analyze program performance once instruction had concluded. This process was sometimes very much a summative activity that ignored the possibility of being able to change instruction throughout the implementation of the curriculum. However, the assessment process has evolved in such a way that it can now be considered an integral part of curriculum development. Forms J and L of the JRCNMT requirements for the annual report have recently been updated to support Nuclear Medicine Technology programs in their effort to meet and exceed industry standards. At Bronx Community College, the NMT program has taken advantage of the newly developed forms J and L to streamline program assessment. These modifications not only changed how assessment is implemented at the end of the program, but also how students are evaluated throughout their coursework.

Keywords:

Assessment, Student Learning Outcomes, Compliance, Forms J and L, Program Outcomes

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The reason for instituting an assessment plan into a program or curriculum is based on the need for overall improvement. Considering this goal, an assessment plan must be designed to address a particular set of learning outcomes. As described by the University of Central Florida, "behavioral and cognitive learning outcomes are given to highlight how Blooms taxonomy can be incorporated into the larger-scale educational goals or guidelines (1)." At Bronx Community College (BCC), the hierarchical structure of Blooms taxonomy is used as a guiding principle in the creation of appropriate and meaningful learning outcomes. The Nuclear Medicine Technology (NMT) program at BCC executes various levels of assessment, with the intention of creating a continually evolving program based on its assessment findings.

Program assessment happens at two levels. The first (and most frequent) are to make sure the program is able to satisfy student level outcomes (SLO's) set forth by the college and approved by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT). The Director of the NMT program and the college administration collaborate to determine which goals the program should target for assessment purposes. These outcomes are then clearly defined in the colleges course catalog, as well as the individual course syllabi. The idea is to make sure the students are aware of what is required of them, and how they will be evaluated throughout the course as formative assessment, and ultimately at the end of the course as a summative measure. Generally speaking, and as a practice at BCC, these outcomes are accompanied by a rubric that acts not only as a metric for formative assessment for the instructor, but also as a guide for student expectations.

The second level of assessment is a directive from the (JRCNMT). In recent years, the JRCNMT has begun to foster a strong emphasis on assessment (at both the student and program level). As part of this emphasis, the JRCNMT has established assessment standards that are reflected on several forms that are the basis of the assessment portion of both the required annual report, and the larger self-study report.

Assessment Resources

It stands to reason that NMT programs across the country will likely have similar resources when it comes to assessment. At BCC, the NMT program benefits from the guidance of the colleges Assessment Council, wherein each department has their own representation. This council was created to help design assessment strategies that address the stated outcomes for each program as listed in the course catalog.

In past years, the NMT program at BCC had to rely on this council to determine how to properly use the gathered data to formulate a strategy for overall improvement. This strategy was designed based on the program level and student level outcomes that were ultimately decided on by the college administration, NMT advisory board and the JRCNMT. Recently, the JRCNMT has increased its involvement in assessment by devoting more resources and creating new streamlined metrics to its assessment requirements, which have surfaced as forms J and L (Assessment of Program Student Learning Outcomes & Program Effectiveness Data, respectively).

Student Learning Outcomes

According to Cornell University, student learning outcomes (SLO's) can be defined as "measurable statements that articulate at the beginning what students should know, be able to do, or value as a result of taking a course or completing a program (2)."

Each institution is required to create their own student learning outcomes based on JRCNMT guidelines and requirements for the accredited program. Recent communications from the JRCNMT have offered guidance focusing on the development and implementation of SLO's. Through a collaborative effort between the NMT Program Director, department Assessment Coordinator and college administration, Bronx Community College (BCC) has embraced these suggestions and, as a result, have updated the colleges current SLO statements.

SLO Development

Developing learning outcomes for the program is a multi-faceted process. These outcomes must serve several purposes. First, the list of SLO's should be designed in such a way that, in theory, when all are met, the student possesses the skills and knowledge required for graduation. This list should address the most important skills, knowledge, and aptitude that students should acquire across the entire program. To be effective, this list is published in the course catalog, making it available for incoming (or current) students to use as a rubric for self-assessment. Through data analysis of final grades, class participation efforts and direct observation reports from both instructors and clinical supervisors as part of the formal assessment procedures for the college, it has been uncovered that students who remain cognizant of these outcomes tend to perform at higher levels due to the increased understanding of course and program requirements. To supplement the effectiveness of "publicly" posting these SLO's, it is also a requirement at BCC to include the list of SLO's on each of the course syllabus that is distributed to the students at the beginning of each semester.

Previously, the number of SLO's for the NMT program at BCC was ten. We had created these ten SLO's based on the requirements of each course. However, through the feedback of the Assessment Coordinator, and the JRCNMT, we found this list of outcomes to be too cumbersome to perform assessment properly. The original intent was to try and link individual SLO's to individual courses. However, program level outcomes are not designed to address specific COURSE outcomes, but rather an overall evaluation of the skills and knowledge a student acquires over the entire program. After evaluating the number of SLO's (not necessarily the SLO's themselves), it was determined that there was a redundancy between them that resulted in inaccurate assessment due to aligning program outcomes to individual courses which dilutes the differentiation between the two.

To rectify this redundancy, we elected to reduce the number of SLO's to five. However, to accomplish this reduction and still have the list represent all the skills and knowledge the students are

required to obtain, the SLO's had to be re-written. The new list of SLO's is general enough to encompass all that is required, but still retain an alignment to specific assessment tools for proper evaluation.

The next issue that had to be addressed was to determine the assessment vehicle that was to perform the assessment on each of these SLO's. At this point, a collaborative effort materialized between the teaching faculty and the assessment and program coordinators. The goal was to look at the syllabus of each course in the NMT program and determine which courses offered the content or activities that addressed the specific SLO's. We would then look toward the formative or summative evaluations of those activities (tests, presentations, etc..) and use that data for the assessment vehicle for a particular SLO.

As a welcomed, yet unintended consequence, we did encounter another set of redundancies, but this time would benefit the assessment process. This redundancy was having multiple assessment vehicles for each of the SLO's. Having multiple assessment vehicles for the same SLO will allow the SLO's to be assessed uninterrupted, through each assessment cycle. For example, due to the current COVID pandemic, some of the assessment methods in each course had to be modified to satisfy the change in teaching modality. Since there are multiple ways of assessing each SLO, we are less likely to be in a situation that does not allow the assessment of any particular outcome due to a change or omission of the curriculum. Ultimately, being able to utilize multiple assessment vehicles across various courses for the same SLO, assured the college that each SLO was able to be implemented and assessed.

Program Effectiveness Data & Benchmarking

Once a proper method of evaluating student learning outcomes has been constructed, and assessment vehicles chosen to address specific SLO's, the data collected must be analyzed for the ultimate purpose of improving the learning experience for students. Again, this is a multi-faceted process.

The method chosen to evaluate a program's effectiveness is only useful when compared to a standard. This standard is known as a benchmark. According to the Center for Community College

Student Engagement (CCCSE), “Benchmarking is the systematic process of comparing an organizations performance on key measures to the performance of others (3).”

At BCC, the Nuclear Medicine Technology Program has established benchmarks that can be found on the recently updated forms J and L of the JRCNMT compliance report.

The benchmarks found on form J reflect the level of competence required of each student as stated in the published student learning outcomes. These benchmarks were chosen based on several factors. First, historical assessment data of the program was analyzed to determine an appropriate and reasonable goal (as described by the SLO’s) for the students to achieve. Historical assessment data was used to minimize the “shot in the dark” attempts at establishing reasonable student goals. These goals are ultimately assessed through both formative and summative means in various courses and throughout various stages of a student’s progress through the program.

Another consideration in the formulation of a benchmark is how it compares to outside requirements. Benchmarks that reflect individual student performance are created at the “local” level and tend to address the requirements of the college. Although these benchmarks are designed with academic performance in mind, they must also align with industry performance as well.

Form L of the JRCNMT compliance report establishes the benchmarks at the industry level. Largely influenced by accrediting standards, these benchmarks are designed as an assessment tool for the program. These benchmarks are influenced by assessment data gathered on an occupational level and reflect a common standard throughout the profession.

Regardless of either a program or student level, a benchmark that will yield accurate assessment data is overwhelmingly assessing a quantitative activity. Due to the objective nature of quantitative analysis, program data can be gathered and assessed across the curriculum, regardless of who is performing the evaluation. This is an extremely crucial aspect of assessment when dealing with program

level effectiveness. To yield accurate assessment results, limiting the amount of subjective variance is critical.

Effective assessment needs to happen at multiple levels at varying times to yield meaningful results. To compile the most accurate data possible, it is up to the instructor to maintain a focus on addressing the student and program outcomes. At the program level, although data is collected on a continual basis, outcomes are generally assessed every two years (which represents a full program cycle). These outcomes should differ from those that are course or student level outcomes.

Over the past few years, our program at BCC has implemented several tools to streamline the process of completing forms J and L, while ensuring that the SLO's are met. The feedback from the JRCNMT has helped to restructure our program by targeting more efficient ways to retain records, organize data, and implement teaching tools. Below is a summary of some elements that we have already restructured to improve the assessment process of our program, while also focusing on plans to enhance the monitoring of our SLO's.

Web-Based Course Management Systems

Web-based course management systems, (such as Blackboard), have served as an integral tool for program assessment. Systems such as these allow for thorough record-keeping that can help keep track of individual grades on assignments and exams. Writing assignments can now be kept with a digital footprint, rather than retaining large quantities of paper files for each student. In addition, the use of discussion boards has allowed students to interact with their classmates, in comparison to submitting paper writing assignments. Another major benefit of these course management systems is the ability to run reports and statistics on assignments or exams. If all students in the course have their assignment recorded in the grade center of Blackboard, for example, the instructor can simply select the column details option from the drop-down menu. This will determine the average, median, standard deviation, range of grades, and more. (See Figure A) This is a huge advantage in improving teaching methods while

also calculating benchmark results on form J. Administering exams on Blackboard, (especially if done in-person in a monitored computer lab), can also be very beneficial. The administrator can allow students to receive and review their grades immediately after the exam, making grading easier for the instructor while decreasing anxiety for the students. In addition, taking an online exam while being monitored in the classroom sets up a similar environment to the board exams. We found that administering a "mock board exam", with the same amount of time and number of questions set by the American Registry of Radiologic Technologists (ARRT) has better-prepared students for their licensure exams. Finally, the way the course material is presented to the student through Blackboard has improved overall student organization. Web-based course management allows the student to access materials all in one location. The course syllabus, lectures, homework assignments, learning outcomes, handbooks, and more can be placed in one location for the student. This has been an incredible asset in improving student performance and retention within our courses.

Online Surveys

Transitioning out of a paper-based collection method has had some challenges, however, is proving to be a more efficient method of record keeping. In the past, all of our surveys were administered on paper and retained for the appropriate amount of time. This not only took up a lot of space but also made data analysis a daunting task. In recent years, we have begun the transition to online surveys, which has immensely improved our organization and collection. Surveys administered to students for individual course instruction, clinical site evaluation, and overall program effectiveness are now administered online. Administering the surveys in this format has allowed us quickly run reports based on student feedback, aiding in assessment and program improvement. Addressing JRCNMT standard D3.1g, (Evaluating graduate assessment of program effectiveness), has been particularly helpful with conducting online surveys. In this online format, the program can put together several questions that pertain to program effectiveness, sending them to the students to easily complete. These results serve as an integral component in completing assessment questions on Form L. (See Figure B). Currently, the surveys that

we give the clinical instructors to evaluate student performance are still on paper. This has created some recent issues, as analyzing the data on specific questions that relate to individual SLO's, can be incredibly time-consuming. In addition, if a clinical instructor is busy with other tasks, they sometimes fill out the form incorrectly and will eventually have to redo it. This creates inefficiencies for both the clinical coordinators and AES's. Moving forward, we will begin to implement these surveys online as well. We feel that this will streamline the process of student evaluations, allowing us to easily interpret trends and areas we need to address with the entire class, improving student performance and assessment strategies.

EPortfolios

Electronic Portfolios are valuable tools that improve student learning, while also aiding in assessment strategies. These portfolios allow students to create individual work on which they can reflect, creating their digital footprint. This allows students to access the information not only while enrolled in the program but even after graduation. Our program has created an NMT EPortfolio for students enrolled in the program. Currently, it is being utilized for resources to be stored in one easy location. In our current EPortfolio, our handbooks, blank evaluations/rubrics, student learning outcomes, and competency forms can all be accessed from the same site. Moving forward, we plan to add a collaborative area for job postings, allowing both recent graduates and instructors to post information about current job openings. We plan to utilize this to improve the job placement assessment portion of form L. The main benefit of this database in comparison to the Blackboard learning management system is the sheer fact that students can still access it after graduation. Helpful resources such as job postings, CT competency forms, board exam information, etc.. can all be accessed in this one location.

Video Conferencing

The pandemic has brought unforeseen challenges which required instructors to quickly adapt to new teaching methods and technology. Although the incorporation of video conferencing software, such as Zoom, was a definite transition, it has proved very useful with both teaching and assessment.

Our program has primarily been using Zoom for a combination of online instruction, meetings, and advisement since the pandemic emerged in March of 2020. This online conferencing platform has allowed us to improve some of our teaching methods as well as assessment. Utilizing this technology has allowed us to hold online information sessions for incoming and prospective students. This has largely improved the participation at these events, while still allowing us to share our screen to show PowerPoints, course expectations, prerequisites, and more. In addition, it still allows students to ask any questions they may have about the Nuclear Medicine field or program expectations. We feel strongly that the increased participation at the information sessions will improve student retention in the program.

Many of our students are considered, "non-traditional", meaning not fresh out of high school, but rather being over 25 years of age. According to an article published in Contemporary Issues in Education Research, "a vast majority of fresh-out-of-high-school "traditional" aged (18-24) enrollees have shifted towards a wave of "non-traditional" aged (25+) students, featuring displaced workers, first-generation college attendees, returning students, and those who desire a change in career (either due to financial hardship or preference), administrators have no choice but to alter collegiate curriculums, services, and overall philosophies. An overwhelming majority of institutions affected by this trend are community colleges (4)." Many of our non-traditional students often deal with the challenges associated with balancing work, family, and school. With these students, in particular, we feel it is very important to hold detailed information sessions detailing program requirements and expectations. During the clinical internship portion of the program, we feel that this transparency is imperative to improve student retention and graduation rates. Form L in the compliance report asks to assess the graduation rate, which this technology should help to improve.

Aside from an increase in information session participation, we also have noticed an increase in participation at the advisory board meetings since being held online. Again, the pandemic has forced this transition, but this is a strategy we plan to continue since there has been a noticeable increase in attendance. Many of the clinical instructors find it challenging to commute to our campus after they finish

work for the day. Traffic, weather, and our proximity to Yankee stadium can cause immense delays in traveling to our campus during rush hours. Fortunately, the use of Zoom for our advisory board meetings has allowed board members to call in from anywhere. This has largely increased our advisory board attendance, also improving assessment strategies on Form L.

Lastly, utilizing this technology has helped us to communicate with students in a private setting. We can now easily hold individual Zoom sessions for radiation badge review, mid-rotation clinical evaluations, and advisement. Zoom sessions can easily be worked around students' clinical internship schedules while accommodating the instructors. As we transition out of the pandemic, our plan is to continue these meetings online.

Student Resources

The annual compliance report has helped our program to recognize areas in need of improvement, especially due to additional challenges associated with the pandemic. More than ever, students are dealing with additional pressures, whether they be financial, psychological, or physical. Over the last few years, we have worked to compile resources offered to our students, easing the burden of some of the financial constraints associated with attending college, while also working to improve their job outlook upon graduation.

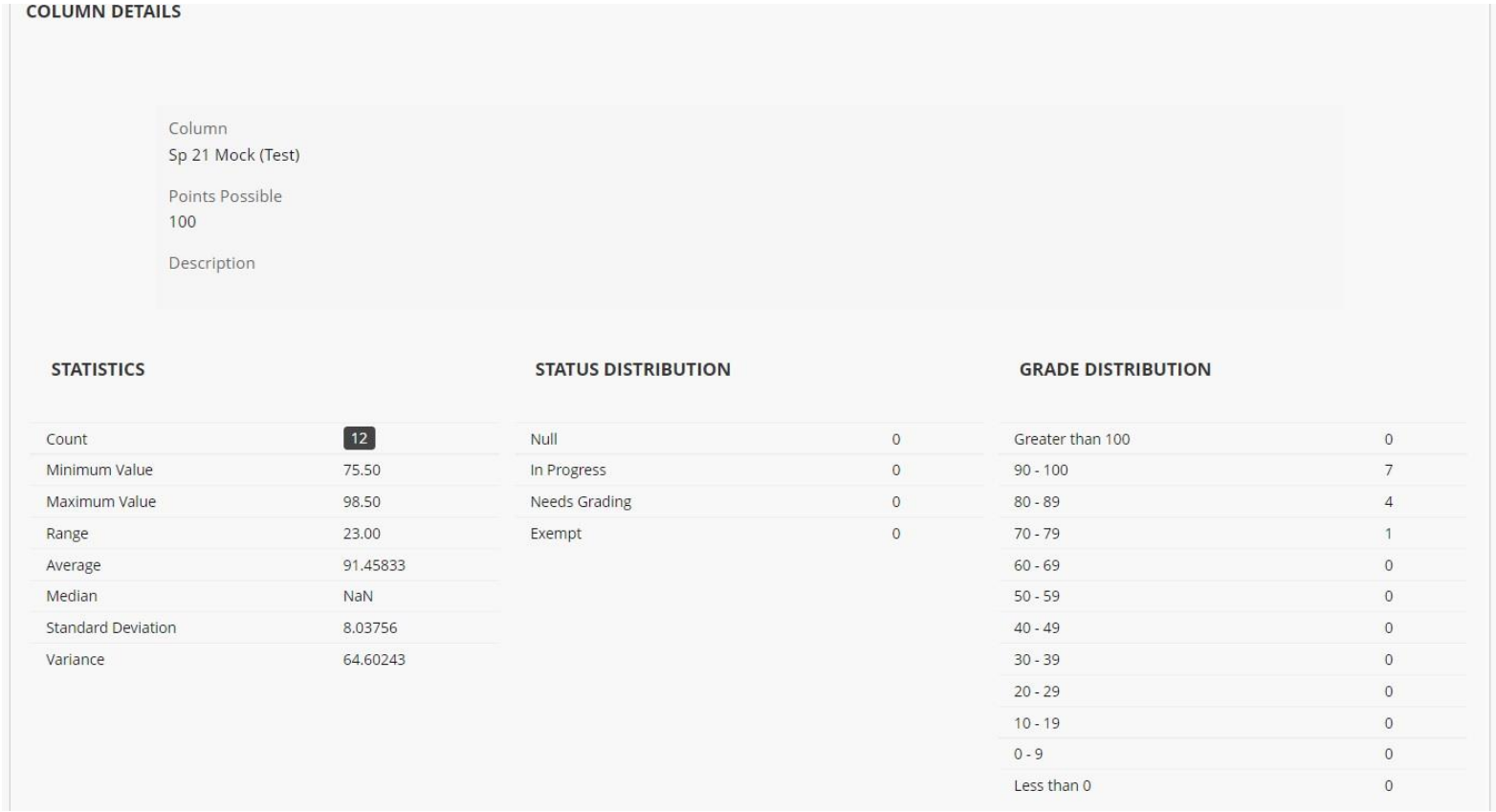
In the last few years, we have been fortunate enough to have applied for and received grant funding for the program. We have utilized this funding to jumpstart tutoring, Computed Tomography instruction, review classes, allocations for conferences, and textbooks. Students in the program now have an option for free tutoring, where select second-year students tutor the first-year students. The second-year students receive an hourly wage, (helping them make some money during clinical internship), while the first-year students can review core Nuclear Medicine topics. Similarly, we have recently begun review sessions for the board exams with past lecturers or outside speakers. Both tutoring and these review

sessions are free for the students and helped to improve both program retention and board exam pass rates.

In addition, with the growing need for PET/CT technologists, we felt it was imperative to incorporate CT instruction into the program. This grant funding has allowed us to hold an elective CT course for students, again, at no additional charge. Also secured within this grant funding, are allocations for conference attendance. We have been able to recently secure funding for hotel and travel expenses to the annual Greater New York Chapter of Society of Nuclear Medicine (GNYCSNM) conference. This conference allows students to present abstracts while increasing their opportunity to network within the industry. These resources have largely helped to improve job placement rates upon graduation, again, more easily meeting our benchmarks on Form L.

As with any program, there is a direct correlation between the support that it receives, and how well it meets its intended goals. Utilizing the feedback from the JRCNMT compliance report, specifically forms J and L, the NMT program at BCC has been able to restructure the tools used for assessment. This restructuring not only allowed us to improve areas of instruction and assessment that focus on student success, but also allowed us to streamline data collection for future analyzation. We plan to continue to use the resources provided by the JRCNMT to track trends within assessment data, while focusing on overall student performance.

Figure A



COLUMN DETAILS

Column
Sp 21 Mock (Test)

Points Possible
100

Description

STATISTICS

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Minimum Value	75.50
Maximum Value	98.50
Range	23.00
Average	91.45833
Median	NaN
Standard Deviation	8.03756
Variance	64.60243

STATUS DISTRIBUTION

Null	0
In Progress	0
Needs Grading	0
Exempt	0

GRADE DISTRIBUTION

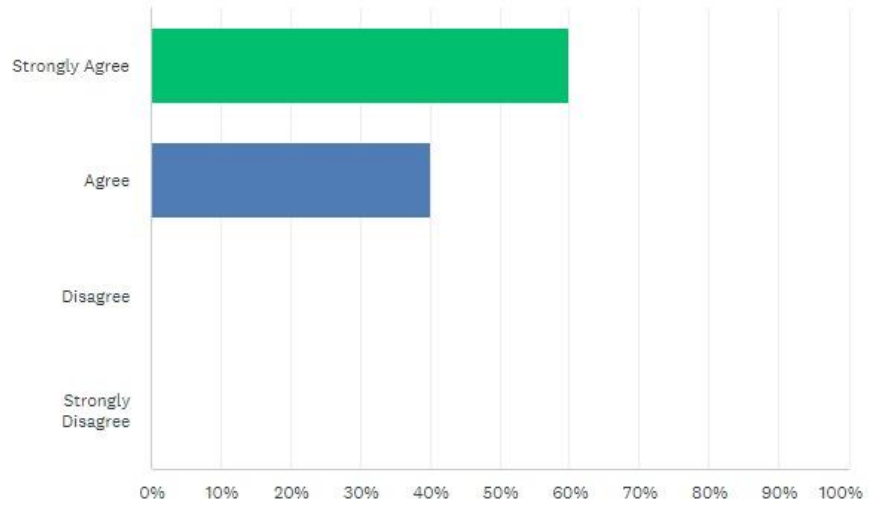
Greater than 100	0
90 - 100	7
80 - 89	4
70 - 79	1
60 - 69	0
50 - 59	0
40 - 49	0
30 - 39	0
20 - 29	0
10 - 19	0
0 - 9	0
Less than 0	0

Figure B

Q15

The program adequately prepared me for the registry exams

Answered: 10 Skipped: 0



ANSWER CHOICES	RESPONSES	
Strongly Agree	60.00%	6
Agree	40.00%	4
Disagree	0.00%	0
Strongly Disagree	0.00%	0
TOTAL		10

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