**Report on Final Exam, CPM-B-Spring 2015**

CPM-B Final exam was requested by 18 high schools. A request was sent to the instructors of these schools to submit a feedback on the performance of the students taking the final exam. For 13 of those 18 schools, we have the feedback. Out of these 13, 8 took the hardcopy final exam and 5 took WebWork final. Out of the 5 schools taking WebWork, 2 schools have only 1 student. It is noticed that WebWork was not used heavily.

Final exam was divided into 3 parts: Part-I had 13 questions, Part-II had 13 questions and Part-III had 14 questions totaling 40. Total number of students took the final exam is 72+ 45=117 and 44+30=74 students received 70% or higher. The percentage of students receiving 70% or higher is 63%. For hardcopy exam this percentage is 61% and for WebWork exam it is 67%. The number of hardcopy user is 72 and that number for WebWork is 45. All this information is based on the feedback we received from instructors. Some instructors, especially hardcopy ones, did not give us any feedback.

Student Learning Outcomes (SLO) for CPM-B are

1. Simplify, factor, and manipulate algebraic expressions and equations.
2. Solve algebraic equations: Linear, Quadratic, Rational, and Radical.
3. Examine and interpret the linear and quadratic graphs of equations and inequalities
4. Solve application problems.
5. Use and interpret function notation in both algebraic and graphical contexts.

Mapping of SLOs to various questions in the CPM-B final exam are as follows:

SLO #1: Q3, Q8 of Part-I.

SLO #2: Q16 of Part-II, Q40 of Part-III.

SLO #3: Q21 from Part-II, Q27 of Part-III.

SLO #4: Q15, Q18 of Part-II.

SLO #5: Q28, Q37 of Part-III.

The number of schools included in this analysis is 13. These schools include Lamar, LyFord, Monte Alto, Sharyland, Valley View, Weslaco High, Weslaco East High, Mission, Edinburg High, Lasara, La Joya, San Benito, Hidalgo ECHS.

The first and last columns of the following table show the SLOs and the number of correct responses.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SLO# | Question #  For Final Exam | Number of  correct responses  (hard copy + WW) | Number of  wrong responses  (hard copy + WW) | Percent of number of  correct responses |
| 1 | Q3 & Q8 | 99+70=169 | 35+18=53 | 76% |
| 2 | Q16 & Q40 | 60+45=105 | 65+37=102 | 51% |
| 3 | Q21 & Q27 | 105+65=170 | 29+16=45 | 79% |
| 4 | Q15 & Q18 | 51+50=101 | 83+32=115 | 47% |
| 5 | Q28 & Q37 | 66+55=121 | 68+24=92 | 57% |

From the final exam results, it is clear that SLO# 4 (application problem) needs to be addressed.

Following table compares outcomes from hard copy and WebWork final exam users for SLO based questions.

|  |  |  |  |
| --- | --- | --- | --- |
| Exam Type | Number of  correct responses | Number of  wrong responses | Percent of number of  correct responses |
| Hard Copy: | 381 | 280 | 58% |
| WebWork: | 285 | 127 | 69% |

The probability that 412 students chosen at random from the whole distribution had better than 69% percentage of correct responses is less than 0.01% making this a statistically significant difference in performance.

**Hard Copy Exams**

1. **School Name: 1**

14 students took the final exam. 12 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 13 1

Q8 12 2

Q15 1 13

Q16 12 2

Q18 7 7

Q21 13 1

Q27 14 0

Q28 14 0

Q37 3 11

Q40 7 7

1. **School Name: 2**

18 students took the final exam. 13 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 12 6

Q8 15 3

Q15 3 15

Q16 12 6

Q18 13 5

Q21 12 6

Q27 17 1

Q28 14 4

Q37 1 17

Q40 4 14

1. **School Name: 3**

6 students took the final exam. 4 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 3 3

Q8 2 4

Q15 3 3

Q16 2 4

Q18 5 1

Q21 2 4

Q27 0 6

Q28 4 2

Q37 6 0

Q40 4 2

1. **School Name: 4**

5 students took the class. 3 students passed the TSI. 2 students took the CPM-B final exam. 2 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 2 0

Q8 2 0

Q15 0 2

Q16 1 1

Q18 0 2

Q21 2 0

Q27 2 0

Q28 2 0

Q37 0 2

Q40 2 0

1. **School Name: 5**

9 students took the final exam. 1 student receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 9 0

Q8 8 1

Q15 8 1

Q16 1 8

Q18 0 9

Q21 5 4

Q27 8 1

Q28 3 6

Q37 0 9

Q40 1 7 1

1. **School Name: 6**

7 students took the final exam. 4 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 7 0

Q8 0 7

Q15 1 6

Q16 6 1

Q18 0 7

Q21 7 0

Q27 7 0

Q28 7 0

Q37 0 7

Q40 5 2

1. **School Name: 7**

7 students in the class. 5 students took the final exam (2 refused to take it). 5 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 5 0

Q8 3 2

Q15 2 3

Q16 3 2

Q18 2 3

Q21 5 0

Q27 5 0

Q28 4 1

Q37 1 4

Q40 2 3

1. **School Name: 8**

6 students took the final exam. 3 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 3 3

Q8 3 3

Q15 3 3

Q16 3 3

Q18 3 3

Q21 3 3

Q27 3 3

Q28 3 3

Q37 4 2

Q40 3 3

**WebWork Exam**

1. **School Name: 9**

12 students took the final exam. 8 completed the exam. 5 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 8 3

Q8 7 4

Q15 2 6

Q16 2 6

Q18 5 3

Q21 6 2

Q27 3 4 1

Q28 4 3 1

Q37 4 3 1

Q40 3 5

1. **School Name: 10**

1 students took the final exam and received 65% in the final exam.

Q# Correct Wrong Partial correct

Q3 1 0

Q8 1 0

Q15 0 1

Q16 1 0

Q18 0 1

Q21 1 0

Q27 1 0

Q28 1 0

Q37 0 1

Q40 0 1

1. **School Name: 11**

6 students took the final exam. No students received 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 4 2

Q8 2 4

Q15 0 6

Q16 0 6

Q18 0 6

Q21 0 6

Q27 6 0

Q28 3 3

Q37 0 6

Q40 2 4

1. **School Name: 12**

25 students took the final exam. 24 students receive 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 24 1

Q8 21 4

Q15 24 1

Q16 14 11

Q18 19 6

Q21 22 3

Q27 24 1

Q28 23 2

Q37 19 6

Q40 22 3

1. **School Name: 13**

1 student took the final exam and received 70% or higher in the final exam.

Q# Correct Wrong Partial correct

Q3 1 0

Q8 1 0

Q15 0 1

Q16 1 0

Q18 0 1

Q21 1 0

Q27 1 0

Q28 1 0

Q37 0 0 1

Q40 0 1

How to improve our reporting

1. We need to get feedback from all instructors who conduct final exams. Right now only a handful of instructors are sending us the feedback.
2. Although WebWork has some feature regarding statistics, it may be better to ask the WebWork instructors also to provide feedback information as the instructors of hard copy exam do.
3. Check is needed during the semester how the course is progressing.