t(283) = 0.76, p = .447].

- Students who passed the parachute course with a grade lower than B (B-, C+, C-) before retaking Physics I had a mean grade of C- in Physics I while those who passed with a B or better had a mean grade between C+ and B-. This difference is statistically significant [B = 2.74 (SE = .65), t(102) = 4.19, p < .001].
- Students who passed the parachute course with a B or better had a mean grade (between C+ and B-) when they retook Physics I compared with a retake grade average between C and C+ for those students who did not take the parachute course. The difference is statistically significant [B = 1.14 (SE = 0.44), t(250) = 2.60, p = .010].

However, when students' UNM cumulative GPA and other covariates were taken into account in the regression analysis, there was no significant difference in average grade when retaking Physics I between the students who received a B or better in parachute course and those students who retook Physics I without taking the parachute course [B = -0.13 (SE = 0.35), Wald z = -0.36, p = .716]. Conversely, students with higher UNM GPAs in general also tended to obtain higher grades in Physics 1 in particular [B = 4.00 (SE = 0.32), Wald z = 12.58, p < .001].

This suggests that the better students (students with higher UNM cumulative GPAs) who are failing to pass Physics 1 at midterm are taking the parachute course.

V. CONCLUSIONS

In this paper we found that the UNM parachute course does a help students avoid a failing grade, but does not necessarily improve their grades when they retake Physics I compared to students who retook Physics I without taking the parachute course.

Suggestions for improving the parachute course include:

- Starting the course earlier in the term and allow time to more fully cover force and motion.
- Heavily recruiting more failing Physics 1 students into the parachute course to have larger impact on student success.
- Study specific issues that parachute students have when retaking Physics I to help guide improvements.
- Reexamine the curriculum to see how it can be improved.
- Consider letting the parachute course be a lead-in for an alternate studio-style sequence of introductory physics for high-risk students that would count the same as the current calculus-based sequence. Including the semester with the parachute course, it would take three semesters studio-style to complete the requirement of the first two traditional semesters of introductory physics. Brahmia [5] found that after two semester of an alternate introductory physics sequence taught studio style, students were able to succeed in upper division courses at a comparable rate to students who completed a traditional two-semester lecture/lab sequence for introductory physics.
- Interviewing former students of both Physics 1 and the Parachute course to generate a needs assessment and doing a demographic analysis are logical next steps.

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[1] In this paper, students dropping courses during the Add/Drop period in the first 3 weeks of the semester are not counted in the DFW rate.

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[9] Students who switch from Physics I into the parachute course are removed from the roster of the Physics I course and are not included in the DFW rate determined once final grades have been submitted.

[10] K. Dimiduk left UNM in summer 2008 to become Director of the James McCormick Family Teaching Excellence Institute in the College of Engineering at Cornell University. Saul was hired to succeed her.

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[12] Modeling Instruction curriculum materials are available from the American Modeling Teachers Association website with membership at https://modelinginstruction.org.

[13] Due to scheduling issues the Spring 2012 parachute course was taught by a senior graduate student who had been a teaching assistant for Saul twice before. No data was available from this course.

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