Table 3. Summary of Data Analysis for Student Academic Outcomes of Reviewed Articles

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| Author, Year | Sample Size | Student Academic Outcome Measured | Statistics | *SD* | | *p*-value | ES |
| Belfi, 2015 | *N* = 101  C = none  E = 101 | Blended Pre-test (1)  Flipped- Independent (2 vs 4) | % improvement  26% vs 17%  d\* = 0.20 |  | | p = .0855  p = .0091 |  |
|  |  | Flipped – Lecture (2 vs 6) | 26% vs 10%  *d*\* = 0.05 |  | | *p* = .0060  *p* = .4051 |  |
|  |  | Independent-Lecture (4 vs 6) | 17% vs 10%  *d*\* = 0.15 |  | | *p* = .2730  *p* = .1731 |  |
| Bösner et al., 2015 | *N* = 17  C = none  E = 17 | % Gain in knowledge/skills from pre- to post-test | 33% difference |  | | *p* < .01 |  |
| Boysen-Osborn et al., 2016 | *N* = 354  C = 259  E = 95 | Overall test median scores (C vs E)  Fill-in  Multiple choice  Rhythm test | 93.5% vs 95.1%  94.1% vs 96.6%  88% vs 90%  100% vs 100% |  | | *p* = .0001  *p* = .0001  *p* = .0002  *p = NS* |  |
| Evans, et al., 2016 | *N* = 279  C = 178  E = 101 | Final Exam  C vs E (2012)  C vs E (2011) | Difference of means  .65  .47 |  | | *p* = *NS*  *p = NS* |  |
| Everly, 2013 | *N* = 139  C = 44  E = 95 | Standardized Exam (ATI) | C vs E  72% vs 76%  *z* = -2.084 |  | | *p* < .05  *p* < .05 | .5 |
|  |  | Final Exam |  |  | | *p* = .371 | .2 |
| Ferreri & O’Connor, 2013 | *N* = 449  C = 146  E1 = 152  E2 = 151 | Grade distribution between control and 2 years of experimental (E1, E2) | C vs E 1  E1 vs E2  C vs E2 |  | | *p* = .033  *p* < .002  *p* < .001 |  |
| Galway et al., 2014 | *N* = 33  C = 22  E = 11 | Exam | *M* = 86.4  *M* = 88.8 |  | | *p* = .72 |  |
| Geist et al., 2015 | *N* = 86  C = 40  E = 46 | Test 1  Test 2  Test 3  Final Exam | *F* [1, 86] = 9.50, *η* = .52  F [1, 86] = 14.38, η = .15  F [1, 86] = 43.59, η = .34  F [1, 86] = 1.95, η = .02 |  | | *p* = .000  p = .000  p = .000  p = .167 |  |
| Gillispie, 2016 | *N* = 70  C = 30  E = 40 | Exams  OB  OB  GYN  GYN  Standardized exam (OSCE)  OB  OB  GYN  GYN | C vs E  Rotation 2 52% 59%  Rotation 3 64% 67%  Rotation 2 58% 68%  Rotation 3 75% 65%    Rotation 2 74% 82%  Rotation 3 70% 82%  Rotation 2 71% 84%  Rotation 3 67% 81% |  | | *p* = .03  *p* = .247  *p* = .0017  *p* =.00011  *p* = .0198  *p* = .0076  *p* = .006  *p* = .0052 |  |
| Harrington et al., 2015 | *N* = 82  C = 41  E = 41 | Course grade  Exam 1  Exam 2  Exam 3  Difference between groups | C = *M* = 86.4  E = *M* = 86.2  C = *M* = 60.2  E = *M* = 60.1  C = *M* = 57.6  E = *M* = 55.9  C = *M* = 82.7  E = *M* = 83.1  lambda = .882 | 3.3  4.2  3.6  3.4  4.0  4.7  4.0  5.4 | | *p* = .092 | .04  .04  .04  .09 |
|  |  | Knowledge & application scores  Mean course grade difference | lambda = .851  *F* =.002 |  | | *p* = .057  *p* = .961 |  |
| Heitz et al., 2015 | *N* = 56  C = 20  E = 36 | Exams | *M* = 13.89  *M* = 14.4  *t* = -0.69 *df* =55 |  | | *p* = .494 95% *CI* (-0.98 to 0.48) |  |
| Kiviniemi, 2014 | *N* = 66  C = 28 | Exam 1 C  E | *M* = 13.25  *M* = 13.61 | 1.35  0.69 | | *p* < .05 | .35 |
|  | E = 38 | Exam 2 C  E | *M* = 13.61  *M* = 14.10 | 0.99  0.89 | | *p* < .001 | .51 |
|  |  | Exam 3 C  E | *M* = 13.76  *M* = 13.54 | 0.96  0.53 | | *p* = .35 | -.29 |
|  |  | Final Course Grade C  E | *M* = 91.76  *M* = 93.92 | 4.95  2.45 | | *p* < .001 | .57 |
| Koo et al., 2016 | *N* = 179  C = 90  E = 89 | Final grade  Final grade distribution | *M* = 83.4  *M* = 88.2 | 7.9  7.3 | | *p* < .001  *p* = .005 |  |
| Leibert et al, 2016 | *N* = 181  C = 92  E = 89 | NBME standardized test | *M* = 75.74  *M* = 74.75 | 8.13  8.16 | | *p* < .28 |  |
| Marshall et al., 2014 | *N* = 277  C = 136 | Standardized test (IRAT)  Osteoarthritis | *M* = 85.9 | 19.1 | | *p* < .001 |  |
|  | E = 141 |  | *M* = 76.6 | 22.5 | |  |  |
|  |  | Gout | *M* = 70.5  *M* = 70.9 | 20.6  20.8 | | *p = NS* |  |
|  |  | Exam  Osteoarthritis | *M* = 85.6 | 10.0 | | *p* = .072 |  |
|  |  |  | *M* = 86.9 | 9.2 | |  |  |
|  |  | Gout | *M* = 84.9 | 11.1 | | *p* = .062 |  |
|  |  |  | M = 82.7 | 11.3 | |  |  |
| Mattis, 2014 | *N* = 48  C = 22  E = 26 | Exam Complexity | *M* = 0.58  *M* = 0.85, *d* = 1.20  *F*(1, 2) = 0.15 | 0.30  0.16 | | *p* = .001  *p* = 0.01 |  |
| McLaughlin et al., 2014\* | *N* = 315  C = 153  E = 162 | Final exam | *M* = 160.06  *M* = 165.48 | 14.65  13.34 | | *p* = .001 |  |
| Missildine et al., 2013 | *N* = 106  C = 53  E = 53 | Exam Scores | *M* = 79.79  *M = 81.89*  *F*(2.586) = 10.69, ω² = 0.032 | 4.51  5.02 | | *p* < .001  *p* < .001 |  |
| Morton, 2016 | *N* = 205  C = 101  E = 104 | Anatomy Exam (Bloom’s taxonomy) Knowledge  Application  Analysis | *U* = 5002.00  *U* = 4990.00  *U* = 4243.00, *r* = 0.19 |  | | *p* = .72  *p* = .70  *p* = .03 |  |
| O’Connor et al., 2016 | *N* = 175  C = 103  E = 72 | Post-test (30 items)  ANOVA | E > C by 5.36% |  | | *p* = .013 |  |
| Pierce & Fox, 2012 | *N* = 71  E = 71 | Final exam | *M* = 77.7  *M* = 81.6 | 4.7  4.4 | | *p* = .024 |  |
| Rui et al., 2017 | *N* = 181  C = 91  E = 90 | EKG interpretation test/grade | *M* = 8.03  M = 8.72  *t* = 4.549 | 1.01  1.01 | | *p* = .000 |  |
| Tune et al., 2013 | *N* = 27  C = 14  E = 13 | Exam score  Cardio  Resp  Renal  Final | C vs E (table approximations)  68% vs 82%  70% vs 83%  66% vs 76%  68% vs 80% | |  | *p* = .05  *p* = .04  *p* = .06  *p* = .03 |  |
| Whillier & Lystad, 2015 | *N* = 58  C = 30  E = 28 | Final grade | *M* = 55.28  *M* = 58.61 | | 13.38    9.05 | *p* = .259 |  |

Note: \*d is the difference in the mean % correct; NS = not significant; ES = effect size, C = control; E = experimental