

Article

Reaching Students Where They Scroll: A Pilot Study Using Facebook as a Supplementary Learning Platform in Undergraduate Anatomy and Physiology Education

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Abstract

Background: Social networking platforms offer promising educational value, particularly for undergraduate students whose daily lives are deeply embedded in online spaces. Yet in most courses, instructional technologies remain limited to institutional learning management systems (LMSs), which often do not foster informal interaction or community. This study examined whether supplementing LMSs with a Facebook group could enhance academic outcomes and retention in undergraduate Anatomy and Physiology (A&P) courses. **Methods:** Over two semesters, two student cohorts ($n = 39$) were taught by the same instructor using identical materials; one cohort also used a closed Facebook group for course-related engagement. **Results:** While final course grades were not significantly different between groups ($p = 0.186$), students in the Facebook cohort scored significantly higher on mid-semester unit exams ($p < 0.001$ to $p = 0.006$). Regression analysis revealed a 9.4% higher mean final course grade among Facebook users. Importantly, the pass rate in the Facebook cohort was 94.7% compared to 45.0% in the control group, with dropout rates significantly lower (5.3% vs. 55%, $p = 0.001$). **Conclusions:** These findings suggest that incorporating social media into undergraduate science instruction may promote academic success and retention by providing a familiar, collaborative space for active learning and peer support.



Academic Editor: Francesco Fornai

Received: 1 September 2025

Revised: 22 September 2025

Accepted: 9 October 2025

Published: 15 October 2025

Citation: Azim, H.M.; Bakatsias, D.E.; Harrington, B.K.; Vespa, P.A.; Spetz, K.A. Reaching Students Where They Scroll: A Pilot Study Using Facebook as a Supplementary Learning Platform in Undergraduate Anatomy and Physiology Education. *Anatomia* **2025**, *4*, 16. <https://doi.org/10.3390/anatomia4040016>

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Keywords: anatomy education; health sciences education; learning community; student motivation; student retention; Facebook

1. Introduction

1.1. Background

Electronic technologies are deeply embedded in modern life and increasingly essential in education. Most U.S. colleges use a learning management system (LMS), such as Canvas or Blackboard, to support online and in-person courses. Yet faculty often limit their use of technology to LMS tools, email, or student response systems like clickers [1–4].

For many freshmen, college represents both an academic and social transition. Social media plays a central role in this process, shaping campus culture and daily routines [5–8]. A study of 300 students found that participants checked Facebook nearly every hour, yet its academic use remains limited [9,10]. Students often prefer mobile devices for learning and value informal, familiar platforms that foster peer and faculty interaction [11]. Engagement with faculty is strongly linked to academic motivation, performance, and retention [12,13]. Despite this, mismatches in student and instructor social media use remain a barrier [14,15].

1.2. Barriers to Engagement and Belonging

Students primarily use LMS platforms because participation is required [16,17]. However, LMS structures rarely encourage informal connections. Their rigidity often leads to passive participation, minimal interaction, and limited community-building [18–20]. This lack of belonging may reduce motivation and performance. Collaborative environments, by contrast, strengthen student motivation and support academic goals [21,22]. Faculty who avoid social media risk disconnection from student communication norms [23]. Building a classroom community requires more than structured discussion boards; informal, flexible tools are crucial. Without them, students may miss out on peer learning benefits. Evidence shows that supportive classroom culture and informal interaction foster deeper engagement [24,25]).

In this study, engagement is defined as both academic (e.g., active participation, accessing resources, and faculty interaction) and social (peer connection, informal support, and belonging). These domains are interdependent, consistent with prior work linking academic and social integration to performance and retention [26,27].

1.3. Rethinking Connection Through Technology

To overcome LMS limitations, educators increasingly explore social media platforms as supplemental learning spaces. Social media can extend learning beyond classrooms, creating interactive and supportive environments. A systematic review showed social media tools, including faculty-moderated blogs, were as effective as small-group learning [28]. Other studies report higher test scores and stronger engagement when platforms such as Facebook and WhatsApp were used [29,30].

Globally, students spend over two hours daily on social media [31]. These platforms' familiarity and accessibility make them well-suited for fostering informal peer learning and community [32,33]. As education shifts away from passive lectures toward active approaches—spaced repetition, flipped classrooms, and near-peer teaching—integrating social media may offer a minimally disruptive means of aligning with student culture [34–36]. Still, challenges exist. Managing a class Facebook group requires additional faculty time, and participation may decline across the semester [37]. Privacy and professionalism are also concerns, especially in open groups. Solutions include creating closed groups, setting clear expectations, and establishing moderator roles [37,38]. Class size matters as well; smaller cohorts are more feasible to manage.

The broader literature underscores that academic and social integration support retention. Survey data from 26,000 students revealed that higher engagement correlated with lower attrition [39]. Similarly, longitudinal analyses of over 8000 students across 44 institutions found that those who persisted into year two engaged more in class and with faculty [40]. Thus, engagement remains central to student success and persistence [27,41].

Social media also shows promise beyond undergraduate education. In healthcare, it supports professional networking, resource sharing, and rapid communication [42–44]. Such uses highlight its potential to strengthen collaborative culture and communication in education more broadly [29].

1.4. Putting It to the Test

This study builds on the first author's experience incorporating a Facebook group into undergraduate Anatomy and Physiology (A&P) courses at a community college in the central Indiana Region, United States. Two sections of A&P 101 were taught by the same instructor with identical materials. One cohort used a closed Facebook group in addition to the LMS, while the other relied only on the LMS. The study examined whether Facebook use correlated with higher performance and reduced dropout. We hypothesized

that students with access to Facebook would demonstrate greater engagement, higher exam scores, and higher course completion rates compared to those without.

2. Methods

This study analyzed data from the official gradebooks of two Anatomy and Physiology (A&P 101) courses taught by the same instructor over consecutive semesters at a community college. The cohorts, while consisting of different students with comparable demographics, received identical curricula, instructional materials, and weekly timeslots. The only distinction was that Cohort B had access to a closed Facebook group in addition to the institutional LMS, whereas Cohort A relied solely on the LMS.

This project was conducted retrospectively, after both cohorts had already completed the course. Following the positive outcomes observed with the Facebook group in Cohort B, the instructor submitted a research protocol to the Indiana University Institutional Review Board, which approved the study as exempt (protocol #1904319982). The exempt determination was based on the use of existing, de-identified gradebooks, and therefore, informed consent was waived. To protect confidentiality, specific years and program levels are not disclosed; students represented a mix of allied health disciplines (e.g., nursing, physical therapy, other health sciences) and were enrolled as part of their regular curriculum.

The study was not conducted at Indiana University but at a community college. Institutional Review Board (IRB) approval was obtained through Indiana University because the instructor was affiliated there, while the community college did not maintain its own IRB. The IRB granted an exempt determination, which allowed analysis of de-identified gradebooks after both cohorts had completed the course and waived the requirement for informed consent.

Because the study was conducted retrospectively, students were not informed during enrollment that their course data might later be used for research. At the time Cohort A was taught, the instructor had no intention of conducting research. The Facebook group introduced in Cohort B was implemented solely as a teaching strategy, alongside the college's official learning management system (Canvas). At that time, the community college had no formal policy regarding the use of social media in teaching, which allowed the instructor to adopt Facebook as a supplementary tool.

The Facebook group was first introduced in Cohort B (the intervention group in this study), and based on its success, the instructor continued to use it in subsequent course offerings over the following two years. For the purposes of this study, however, only the first cohort to use Facebook (Cohort B) was compared with the immediately prior cohort that did not use Facebook (Cohort A). This comparison was chosen intentionally to minimize potential confounders such as time gaps, curriculum revisions, or changes in course scheduling. It was also appropriate because the instructor taught only one course without the intervention at this institution, so only one subsequent course with the intervention could serve as a meaningful comparison group. We did not compare the single non-intervention cohort against multiple later cohorts, as this would have introduced additional bias.

Building on this instructional experience, a private Facebook group page was introduced for Cohort B as a supplement to the institution's LMS platform and later evaluated as the central intervention in this study. The page was created and actively moderated by the course instructor. Access was restricted to students enrolled in Cohort B and the instructor, ensuring a secure, closed-group environment. The page was intended to function as a supplementary learning space—not a requirement for course participation—and provided a flexible, informal platform for academic interaction. Posts included reminders about quizzes and lab activities, supplemental learning tips, study resources, and motivational

messages. Students were encouraged, though not mandated, to ask questions, share ideas, and engage with each other on course-related topics. The instructor routinely monitored group activity to respond to questions and promote a respectful and supportive learning atmosphere. No grades or participation points were tied to Facebook group activity.

All enrolled students' data in both classes were included in the study: Cohort A ($n = 20$) and Cohort B ($n = 19$), for a total sample size of 39. No exclusion criteria were applied. The only sources of data were the instructor-maintained gradebooks and demographic information routinely collected at course enrollment.

Course assessments included four unit exams (each composed of a lecture and a lab component) and ten quizzes (five lecture and five lab). For the purposes of analysis, only the first, second, and final unit exams were included. These consisted of Lecture Exam 1, Lab Exam 1, Lecture Exam 2, Lab Exam 2, Final Lecture Exam, and Final Lab Exam. The third unit exam was excluded because the majority of students who eventually dropped the course had already disengaged by that point and did not complete the exam. Including it would have introduced substantial missing data. While this decision reduced the number of data points, including the third exam would have disproportionately reflected only those students who persisted, thereby introducing analytical bias. By focusing on the first two unit exams and the final exam, we ensured more consistent comparisons across cohorts while minimizing distortions related to attrition. It was assumed that the first, second, and final unit exams offered sufficient information to evaluate both individual and group-level academic performance. Each of the lecture and lab exams from units 1 and 2 was graded out of 50 points. Final lecture and lab exams were graded out of 75 points. Final course grades were calculated as percentages on a 100-point scale. No content from the Facebook group (e.g., posts, comments, or interactions) was analyzed in this study. Only de-identified gradebook data and demographic information routinely collected at enrollment were used. Participation in the Facebook group was voluntary, and access was restricted to enrolled students and the instructor. The study was reviewed and determined to be exempt by the Institutional Review Board.

Demographic data and exam scores were entered into SPSS statistical software (version 24) for analysis. The primary outcome variable was students' final course grade (%). The main independent variable was Facebook use (yes/no). Descriptive statistics included means and standard deviations for continuous variables (i.e., age, exam scores, and final course grades) and frequencies and percentages for categorical variables (i.e., gender, race, Facebook use, and dropout status). Inferential statistical tests included independent sample *t*-tests, chi-square tests, linear regression, and correlation analysis. The significance level (α) was set at 0.05, and *p*-values below this threshold were considered statistically significant.

3. Results

A total of 39 students were included in the study: 20 students (51.3%) in Cohort A (no Facebook) and 19 students (48.7%) in Cohort B, which used a closed Facebook group as an additional learning platform. Demographic characteristics, including age, gender, and race, were broadly similar between the cohorts, with no statistically significant differences. Full demographic data is presented in Table 1.

Table 1. Student demographic data.

Variable	Cohort A $n = 20$	Cohort B $n = 19$	<i>p</i> -Value
Age, mean (SD)	27.15 (6.9)	26.16 (5.2)	0.246
Gender			

Table 1. *Cont.*

Variable	Cohort A <i>n</i> = 20	Cohort B <i>n</i> = 19	<i>p</i> -Value
Female	18	17	1.000
Male	2	2	
Race			
White	14	16	0.487
Black	3	1	
Asian	1	0	
Latino/Latina	0	1	
Indian	2	1	
Dropped out	11	1	0.001

3.1. Academic Performance

The primary outcome variable was final course grade (%). The study examined whether Facebook use had a statistically significant impact on students' final grades or individual unit exam scores. Final course grades were available for 27 of the 39 students; the remaining 12 students dropped out prior to the final exam.

A correlation matrix of numerical variables confirmed that student age was not significantly correlated with final course grade ($p = 0.744$, $r = 0.066$). In contrast, each of the six unit exams—Lecture Exam 1, Lab Exam 1, Lecture Exam 2, Lab Exam 2, Final Lecture Exam, and Final Lab Exam—was strongly and significantly correlated with final course grade, with all p -values < 0.001 and correlation coefficients ranging from $r = 0.840$ to $r = 0.937$. These values highlight the predictive strength of students' assessment scores across the semester. The full results are shown in Table 2. Also, Figure 1 illustrates mean comparisons of student grades between the two cohorts.

Table 2. Mean comparisons of student grades between Cohort A (no Facebook) and Cohort B (Facebook), with effect sizes and correlation to final course grade (%).

Unit Exams & Final Course Grade	Cohort A Mean (SD)	Cohort B Mean (SD)	<i>p</i> -Value	Effect Size (Cohen's <i>d</i>)	Correlation with Final Course Grade (<i>r</i>)
Lecture Exam 1	31.6 (5.4)	41.4 (8.3)	<0.001	1.41	0.840
Lab Exam 1	28.7 (10.5)	39.3 (11.1)	0.004	0.98	0.850
Lecture Exam 2	31.6 (7.3)	39.6 (9.7)	0.006	0.94	0.875
Lab Exam 2	24.5 (11.7)	35.8 (11.2)	0.004	0.99	0.931
Final Lecture Exam	50.6 (14.1)	54.3 (12.5)	0.492	0.28	0.845
Final Lab Exam	49.3 (19.1)	58.3 (15.9)	0.206	0.51	0.937
Final Grade (%)	64.4 (16.7)	73.9 (17.2)	0.186	0.56	-

Note: This table presents mean scores out of 50 points (with standard deviations) for each unit exam and final course grade across both cohorts. p -values reflect independent sample t -tests, and Cohen's d effect sizes quantify the magnitude of between-group differences. Pearson correlation coefficients (r) represent associations between each exam and the final course grade, based on students who completed the course ($n = 27$). Correlations are not listed for final course grade, as it was the outcome variable.

Comparisons of Mean Grades Between Cohort A and Cohort B

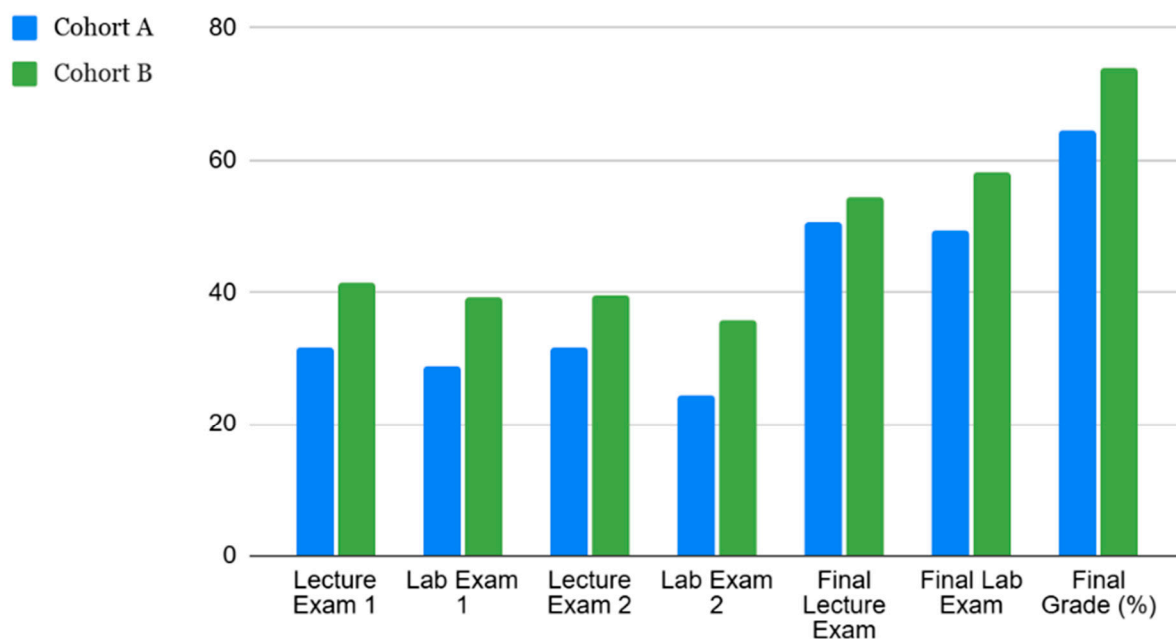


Figure 1. Mean comparisons of student grades between Cohort A (no Facebook) and Cohort B (Facebook).

Independent sample *t*-tests revealed statistically significant differences in performance between the Facebook and non-Facebook cohorts for Lecture Exam 1 ($p < 0.001$), Lab Exam 1 ($p = 0.004$), Lecture Exam 2 ($p = 0.006$), and Lab Exam 2 ($p = 0.004$). However, no statistically significant differences were found in Final Lecture Exam ($p = 0.492$), Final Lab Exam ($p = 0.206$), or Final Course Grade (%) ($p = 0.186$). Effect sizes (Cohen's *d*) indicated large differences on early unit exams ($d = 0.94$ – 1.41), whereas effects for the final exams were small to medium (Final Lecture Exam $d = 0.28$; Final Lab Exam $d = 0.51$), and the effect for the final course grade was also in the medium range ($d = 0.56$). These results are consistent with the finding that early performance gains did not persist through the end of the semester at a level that reached statistical significance.

To further explore this finding, we conducted a post hoc power analysis of the final course grade comparison. Using the observed effect size (Cohen's $d \approx 0.56$; Cohort A $n = 20$, Cohort B $n = 19$; $\alpha = 0.05$, two-tailed), the estimated power was only ~40%. This suggests that the lack of statistical significance may be attributable to insufficient sample size rather than a true absence of effect. Based on these parameters, approximately 51 students per group would be needed to achieve 80% power. These results suggest that while students using Facebook performed significantly better in earlier exams, this benefit did not extend to final exam scores or overall course grades.

Across assessments, Cohort B (Facebook, $n = 19$) consistently achieved higher mean scores than Cohort A (no Facebook, $n = 20$), with statistically significant differences observed for the early unit exams (Lecture Exam 1, Lab Exam 1, Lecture Exam 2, and Lab Exam 2). Differences in final exam performance and final course grade did not reach statistical significance.

To further evaluate the relationship between Facebook use and final course grades, a linear regression analysis was conducted. Using Facebook participation as the predictor variable and final course grade as the outcome, the regression equation was:

$$\text{Final Course Grade (\%)} = 64.444 + 9.444 \times \text{Facebook}$$

Students who used Facebook scored an average of 9.44 percentage points higher, though the model's $R^2 = 0.069$, indicating limited explanatory power. The p -value = 0.186, which was not statistically significant. A follow-up multiple regression analysis incorporating early exam scores did not improve model significance, and stepwise modeling excluded Facebook from all predictive models, reaffirming that Facebook use was not a significant predictor of final grades.

3.2. Student Retention and Dropout Rates

A key difference between the two cohorts was the rate of student retention. Of the 39 students included in the study, 12 (30.8%) dropped the course before completing the final exam. However, retention varied dramatically between cohorts: 11 students dropped from Cohort A (55%), while only 1 student dropped from Cohort B (5.3%). This difference was statistically significant based on a chi-square test ($p = 0.001$), strongly suggesting a relationship between Facebook use and reduced dropout rates. For clarity, Figure 2 visually depicts this sharp difference in dropout rates between Cohort A and Cohort B. To further contextualize this finding, we calculated the effect size, which indicated a strong association between Facebook use and course retention (Cramér's $V = 0.54$, 95% CI [0.30, 0.75]). Students who participated in the Facebook group were significantly less likely to drop the course, suggesting that the social and academic support provided via the platform may have positively impacted engagement and course completion.

Drop Out Rate Amongst Cohort A and Cohort B

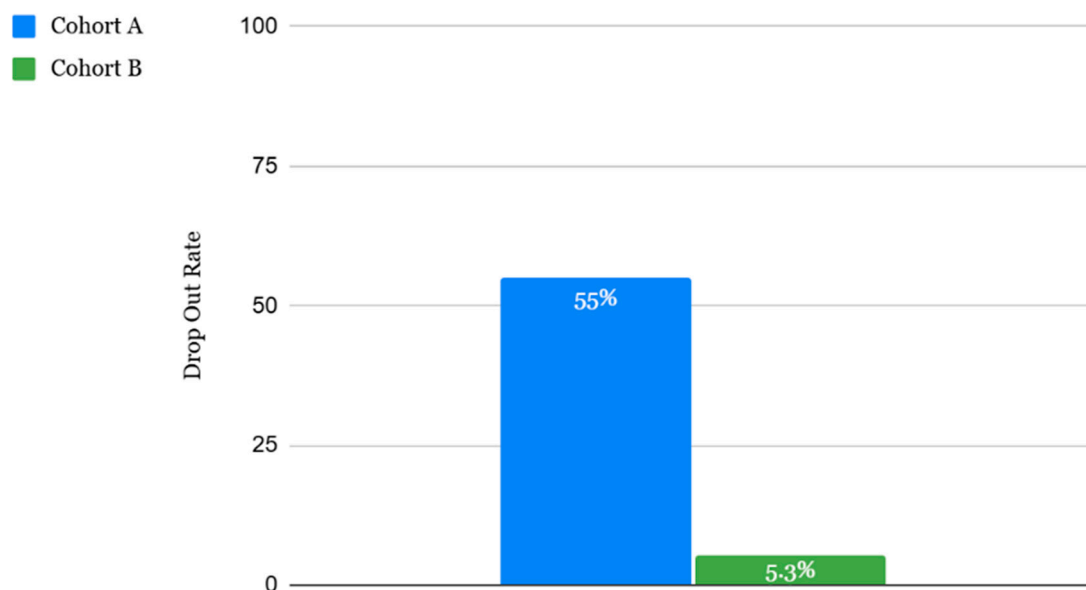


Figure 2. Comparison of dropout rates between Cohort A (no Facebook) and Cohort B (Facebook).

The bar chart illustrates the proportion of students who dropped the course before completing the final exam in each cohort. Cohort A ($n = 20$) had a dropout rate of 55% (11 students), whereas Cohort B ($n = 19$) had a dropout rate of only 5.3% (1 student). This difference was statistically significant ($\chi^2 = 12.16$, $p = 0.001$; Cramér's $V = 0.54$, 95% CI [0.30, 0.75]).

4. Discussion

This study explored the potential benefits of incorporating Facebook as a supplementary learning tool in undergraduate Anatomy and Physiology (A&P) classrooms. The initial hypothesis proposed that Facebook use could enhance student motivation, engagement,

and sense of community—factors that might translate into improved academic performance and reduced dropout rates. Overall, statistical analyses revealed significantly higher scores on early unit exams and substantially lower dropout rates among students who used Facebook. While the difference in final course grades was not statistically significant, the observed trends point to a positive association between Facebook use and student success; however, these results should be interpreted with caution since improvements in early performance did not extend to final outcomes.

4.1. Learning in the Feed: How Facebook Supported Performance

To better understand how Facebook might support student learning, we examined its impact on both academic performance and course retention. Independent sample *t*-tests revealed significantly higher early unit exam scores in the Facebook group, and correlation analyses demonstrated strong associations between these scores and final course grades. Linear regression indicated that Facebook users scored an average of 9.44 percentage points higher than non-users, though this difference did not reach statistical significance ($p = 0.186$), and the model's explanatory power was limited ($R^2 = 0.069$). As such, this result does not support strong claims about Facebook's predictive role in final grades and is best interpreted as an exploratory trend that warrants further investigation in larger, randomized studies. This pattern mirrors earlier findings by Klein [45], who documented similar improvements in science achievement when using Facebook to support classroom instruction.

These findings align with a growing body of research suggesting that social media platforms can promote collaborative learning, improve communication with instructors, and facilitate the exchange of academic resources and peer support [46,47]. Several studies echo this perspective: Cheston et al. [28], Guckian et al. [29], and Ashraf et al. [48] all reported enhanced academic outcomes when social media was purposefully embedded into educational contexts. Ashraf et al. [48] further highlighted the importance of social constructivist learning principles and the technology acceptance model in maximizing the pedagogical value of these platforms. However, unlike our small sample of 39 students, their findings were based on a much larger population ($n = 233$). The lack of statistical significance in our regression model may therefore reflect limited statistical power rather than the absence of a real effect.

Interestingly, although students in the Facebook group consistently outperformed their peers in early assessments, no statistically significant difference was observed in final lecture or lab exam scores. While effect sizes for the early unit exams were large, those for the final exams and overall course grade were only in the medium range, underscoring that the early performance advantage of the Facebook cohort did not fully translate into final outcomes. One possible explanation for this is the substantial imbalance in cohort sizes among students who completed the final exams: 18 were from the Facebook group, but only 9 were from the non-Facebook group. This uneven distribution may have limited our ability to detect significant differences at the end of the semester. Nonetheless, correlation coefficients between all six unit exams and final course grade were robust ($r = 0.840$ to $r = 0.937$), emphasizing the predictive value of ongoing assessment.

4.2. Belonging and Persistence: The Retention Effect

Perhaps the most striking finding of the study was the sharp contrast in dropout rates. While over half of the students in the non-Facebook group (55%) dropped the course, only one student (5.3%) from the Facebook group did so. This difference was statistically significant ($p = 0.001$), suggesting that participation in a class Facebook group may contribute to increased retention. These findings align with prior literature on social

integration and academic persistence, where belongingness and peer support play critical roles in student success [49,50].

This retention effect may be further understood through Tinto's model of student persistence, which emphasizes that academic integration (e.g., performance and faculty interaction) and social integration (e.g., peer relationships and sense of belonging) are both essential for continued enrollment [49]. Participation in the Facebook group likely facilitated community-building, informal peer support, and increased instructor accessibility—all of which may have enhanced students' sense of belonging and commitment to the course. Motivational factors, such as accountability to peers within the group and encouragement from the instructor, may also have contributed to the markedly lower dropout rate observed in the intervention cohort.

In addition, the exclusion of the third unit exam deserves consideration in the context of retention. Many students who ultimately dropped the course had already disengaged by that point and did not complete the exam. Including this exam would therefore have disproportionately reflected only those who persisted, obscuring the relationship between early disengagement and course withdrawal. By focusing instead on the first two unit exams and the final exam, we sought to preserve comparability across cohorts while minimizing analytical bias related to selective attrition.

It is important to note that the Facebook intervention was introduced only after Cohort A had completed the course and was subsequently continued in all later offerings taught by the instructor, ensuring that future students consistently benefited from this additional support.

Beyond statistical outcomes, the use of Facebook in a health sciences classroom also raises important ethical considerations. Although this study was approved by the IRB and involved only de-identified gradebook data, broader questions remain regarding privacy, professionalism, and digital boundaries when incorporating social media into formal education. Students may feel pressure to participate in a platform that blurs personal and academic spheres, potentially raising concerns about surveillance or loss of control over their digital presence. In health professions education, these concerns are heightened given the emphasis on professionalism and confidentiality. In this study, the Facebook group was created as a closed group with membership restricted to enrolled students and the instructor, and the instructor served as the sole moderator with full oversight of all postings and engagement. These safeguards ensured that participation remained secure, respectful, and academically focused. Still, any use of social media in medical or health sciences education should be carefully balanced against ethical considerations to ensure that benefits to learning do not compromise student autonomy or professional standards.

4.3. Demographics and Data Boundaries

Analyses of student age, gender, and race were not used to draw conclusions about academic outcomes due to the small and uneven distribution of participants across demographic subgroups. For instance, the sample was ~90% female and ~77% White, with limited representation from other racial and gender identities. Additionally, age was not significantly correlated with final course grade ($p = 0.744$), and including a quadratic age variable failed to improve the relationship. These limitations restricted meaningful subgroup comparisons, and investigating such effects was beyond the scope of the current study.

4.4. Limitations and Future Directions

This study was limited by its relatively small sample size ($n = 39$) and lack of randomization. The findings, while promising, cannot be generalized without caution. These

limitations also reduce statistical power and may help explain why improvements in final course grades did not reach statistical significance despite consistent positive trends. A post hoc power calculation based on the observed difference in final grades (Cohen's $d \approx 0.56$) yielded only ~40% power, suggesting that the lack of significance may reflect insufficient sample size rather than a true null effect. To achieve 80% power at this effect size, approximately 51 students per group (≈ 102 total) would have been required.

In addition, unmeasured factors such as individual motivation, personality traits, or comfort with social media may have influenced how students engaged with the Facebook group, and these potential confounders could not be controlled for in the present study. Because the design was retrospective and non-randomized across consecutive cohorts, causal inference is further limited, and cohort (time) effects cannot be excluded.

Future research with larger, randomized cohorts across multiple institutions will be necessary to validate and extend these preliminary results. Expanding the study to include other science courses and institutions could further test whether social media integration benefits extend beyond A&P education. Finally, qualitative studies capturing student perspectives may shed light on the mechanisms by which social media influences motivation, engagement, and persistence in college learning environments.

Because this was a retrospective study using completed course data, it was not possible to implement a randomized controlled trial (RCT) or a crossover design. Each semester functioned as a standalone course, and the Facebook group was integrated across the entire semester, making it impossible to alternate interventions within the same cohort. The sample size was also determined by the natural enrollment of the two available courses, rather than by a priori calculation. Future studies designed prospectively with larger cohorts, randomization, or crossover structures would be valuable to confirm and extend these findings.

5. Conclusions

This study contributes to a growing body of evidence suggesting that incorporating familiar social media platforms—such as Facebook—into undergraduate science instruction can positively influence student engagement and retention. Although improvements in final course grades did not reach statistical significance, students who participated in a course-specific Facebook group demonstrated significantly higher early exam scores and dramatically lower dropout rates. These findings highlight the potential of social media to serve as a supplemental academic space that fosters motivation, peer collaboration, and a sense of community—especially in courses with high cognitive demands like Anatomy and Physiology. In an educational landscape where students are deeply embedded in digital culture, embracing accessible and relatable tools may help instructors connect more effectively with their learners. By meeting students where they already are—online—educators can expand opportunities for engagement that extend beyond the capabilities of traditional learning management systems. While further research involving larger and more diverse samples is needed, the present study highlights the promise of low-barrier, high-familiarity platforms in supporting student success in higher education.

Author Contributions: H.M.A. designed the study and collected the data. H.M.A. and D.E.B. participated in data analysis. D.E.B., P.A.V. and B.K.H. drafted the initial manuscript. P.A.V. and K.A.S. finalized the manuscript. H.M.A. supervised data analysis and manuscript preparation. All authors have read and agreed to the published version of the manuscript.

Funding: The authors did not receive support from any organization for the submitted work.

Institutional Review Board Statement: All procedures performed in this study followed the ethical standards of the Institutional Review Board (IRB) of Indiana University and the principles of the Declaration of Helsinki. The study was reviewed and approved by the Indiana University IRB (protocol #1904319982) with an exempt determination.

Informed Consent Statement: As determined by the Indiana University IRB, this study qualified for exemption and included an institutional waiver of written informed consent. The IRB determined that informed consent was not required because the research involved retrospective analysis of de-identified educational data collected after course completion.

Data Availability Statement: The majority of data generated and analyzed during this study are included in this published article. Complete raw datasets generated in this study are available from the corresponding author on reasonable request.

Conflicts of Interest: The authors declare no conflict of interests.

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