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Publication Counts and Student Participation in a Graduate Oncology Course: A Documentary Analysis

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Abstract Course publication lists are often used to illustrate the benefits of research-oriented teaching, yet the number of papers does not identify how many students contributed or what they learned. We examined the publication and assessment records of a graduate oncology course to establish which conclusions the published material supports. The analysis covered five annual enrollment entries, 18 publication entries, a presentation rubric, and a grading schedule. A DOI-linked register separated publication identity, course year, printed reference year, research activity, and topic. We then compared alternative counting rules and derived conservative bounds on the number of enrolled authors. The 18 publications had only 16 distinct author-year labels. Ten were primary investigations and eight were literature syntheses; 16 focused on cancer. Annual counts were 2, 4, 4, and 8 by course year, compared with 2, 4, 2, and 10 by printed reference year. Synthesis remained at two works per course year, so investigations accounted for the entire six-work increase between the first and last rows. The pooled count was 32.14 works per 100 registrations, falling to 24.39 when the in-progress 2024 course was excluded. These quotients could not identify the proportion of students who published, and the assessment material did not support a calculation of learning gains. The case shows why publication identity and counting rules need to be reported explicitly, while claims about student participation require verified authorship links and claims about learning require direct assessment.

Index Terms graduate education, oncology education, publication counts, student participation, documentary analysis, assessment validity

I. Introduction

A course publication list gives a visible record of scholarly work. Its meaning as educational evidence is less straightforward. One paper may involve several enrolled students, while another may have only one student author who also contributed to other papers. Some projects begin before enrollment and appear in print after the course has ended. Substantial student work may never be published. These possibilities matter whenever publication totals are used to describe participation, subject knowledge, or the success of a teaching approach.

The distinction is not an argument against research-oriented teaching. Evidence from undergraduate science, technology, engineering, and mathematics supports active learning when effectiveness is assessed through defined academic outcomes [1], [2]. It also shows why different kinds of educational evidence should be kept separate. Students' perceptions of learning can diverge from their performance [3], and classroom observations provide information about teaching practice that an instructor's description alone cannot supply [4]. Publication counts add information about scholarly products, but cannot substitute for these measures.

Research on course-based experiences offers a useful basis for interpreting those products. Auchincloss and colleagues emphasize scientific practices, discovery, broader relevance, collaboration, and iteration [5]. Corwin and colleagues distinguish course design from students' experiences and subsequent outcomes [6]; Linn and colleagues similarly describe the opportunities and variation within undergraduate research [7]. These distinctions remain relevant to a graduate course, although findings from undergraduate settings cannot provide numerical expectations for graduate oncology education. A literature synthesis and an experimental investigation may both involve demanding intellectual work, but their publication genres reveal little about the responsibilities assigned to individual students.

Studies of research participation therefore use measures tied to the experience under investigation. The Project Ownership Survey asks learners directly about their relationship with scientific inquiry [8]. The SEA-PHAGES study examines research and learning within an organized program [9], while Adedokun and colleagues distinguish research skills, self-efficacy, and career aspirations [10]. Presentation and peer-feedback activities also require their own evidence: peer-assessment studies evaluate academic outcomes [11], accounts of self-regulated learning distinguish several learning

processes [12], and feedback effects vary across settings and designs [13]. A publication list or a published rubric does not measure these constructs.

Even before educational interpretation, a publication count depends on decisions about identity and inclusion. Short author-year references may name different papers, and course years need not match publication years. The Leiden Manifesto's call for transparent, context-sensitive indicators applies to these small datasets as much as to institutional research evaluation [14]. Author identifiers help resolve identity [15], and contributor-role statements describe work undertaken within a collaboration [16], [17]. Neither, on its own, verifies enrollment in a particular course.

We examine these issues through the published records of one graduate oncology course. The question is specific: how do publication identity, year allocation, research activity, topical scope, and enrollment denominators change the description of its scholarly output, and what remains unknown about student participation? The study is a documentary analysis, not an evaluation of a new teaching intervention. Its contribution is a worked example in which each count can be traced to individual publications and each educational inference can be checked against the information available.

II. Materials and methodology

A. Course Records and Units of Analysis

The materials concern the Molecular Basis of Cancer course (76000123) at Tsinghua Shenzhen International Graduate School [18]. Its account describes student-led presentations, discussion, peer assessment, and reflection. We treat these practices as the reported instructional context; we did not observe the classes. We did not add papers on the basis of shared authors, institutions, or topics. Thus, the analysis covers the complete published list, not necessarily every output associated with the course. Annual enrollment figures are described as registrations because the records do not rule out repeat enrollment.

The two analytical units are a distinct publication and an annual course-table row. A paper's presence in that row records the course association claimed in the published account; it does not independently verify an enrolled author's identity or contribution. No student roster, completed rubric, numeric grade table, interview transcript, or record of project dates was supplied. Missing information is retained as missing: an unavailable publication count is not treated as zero.

B. Publication Identity and Classification

Each entry was assigned an identifier (P01–P18) and matched to a title and DOI in the course account's bibliography. The register retains the printed author-year label, course row, printed reference year, journal, activity category, topic, verification location, and coding rationale. Entries sharing an abbreviated label were retained when their titles and DOIs identified different works.

The supplied verification record uses publisher pages or indexed abstracts to establish bibliographic identity and inform classification. Full-text access varied. This check concerns what the documents are and how they are counted; it does not validate their biomedical results. P09 has a linked corrigendum, whose complete text was not retrieved. The notice is documented in the accompanying publication-status note and is not counted as an additional course output. No biological measurement or image from P09 is reused here.

We classified each work as either a literature synthesis or a primary investigation. A synthesis integrates findings without a new empirical or computational investigation as its central contribution. An investigation analyzes observations, computational data, biological models, or interventions within the paper. The classification follows content rather than the publisher's article label. For example, P02 is coded as synthesis although its publisher calls it a short communication. A computational study may qualify as an investigation without collecting new biological specimens.

Topic was coded independently. Cancer-focused work has cancer biology, diagnosis, prognosis, or treatment as its central subject. Papers centered on Parkinson disease, obesity, or neurodegeneration were coded as other biomedical work, even where mechanisms overlap with oncology. This rule describes disciplinary focus, not quality or educational relevance. The classifications use titles, abstracts, and available article information; record-specific explanations are included, but independent second-coder agreement was not assessed.

The register separates these analytical decisions from bibliographic fields. Stable identifiers allow a reader to trace a paper across all counts and figures. The accompanying code and variable descriptions make the transformations reproducible, consistent with the principles of transparent research [19] and reusable data stewardship [20].

C. Course Year and Reference Year

Let c_j be the course-table year assigned to publication j, and b_j its printed reference year. We calculated

$$M_{uv} = \sum_{j=1}^{18} \mathbf{1}(c_j = u,\ b_j = v), \tag{1}$$

where $\mathbf{1}$ is the indicator function. Row totals count works by course association; column totals count them by printed reference year. An off-diagonal entry indicates disagreement between these two conventions, not an attribution error.

This distinction affects P07 and P09, which appear in the 2023 course row but have 2024 references. The supplied bibliographic checks identify online availability in 2023 for both; P09 has an online date of 20 December 2023 and a February 2024 issue date. We therefore do not treat the printed reference year as a uniform first-publication date. Neither year field establishes when a project began, when students contributed, or when a manuscript was submitted.

D. Enrollment Quotients and Sensitivity Checks

For course year t, let K_t be the number of distinct listed works and N_t the number of registrations. We report

$$Q_t = 100\frac{K_t}{N_t}. \tag{2}$$

as works per 100 registrations. This quotient compares document volume with enrollment size; it is not the percentage of students who published. Students may share papers, contribute to several papers, or not appear on any listed paper. Registrations also provide no measure of time at risk, so the quotient is not an incidence rate.

The pooled quotient is $100\sum_t K_t/\sum_t N_t$ across the 2021–2024 rows with available counts. The 2020 row is excluded because its numerator is unavailable. We also calculate the pooled value without 2024, which the published table marks as a class in progress. This is a restriction of the observed record, not a projection of the completed course. Counts grouped by printed reference year are not divided by same-year enrollment, because that denominator would no longer follow the documented course association.

To show dependence on individual entries, we compare each complete row with the same row after one work is omitted:

$$D_t = \left[100\frac{K_t - 1}{N_t},\ 100\frac{K_t}{N_t}\right], \qquad K_t \geq 1. \tag{3}$$

The endpoints are deterministic values, not confidence or prediction limits. Each check changes one course row and leaves the others unchanged. We also restrict counts to cancer-focused works, primary investigations, cancer-focused investigations, and literature syntheses. Because the 2021 and 2024 rows both contain 15 registrations, their endpoint comparison separates changes in publication composition from changes in enrollment.

We use no hypothesis tests or fitted time trends. The four rows do not follow the same students over time and are not a random sample of courses. The sample comprises all entries in the stated corpus; this is the relevant sample-size rationale, rather than a power calculation for an unperformed intervention [21].

E. Student Authorship and Assessment Records

Let $A_{ijt} = 1$ when enrolled student i is an author of listed work j in course year t, and zero otherwise. The number of enrolled students with at least one listed authorship is

$$B_t = \sum_{i=1}^{N_t} \mathbf{1}\left(\sum_{j:c_j=t} A_{ijt} > 0\right). \tag{4}$$

Publication totals do not identify the array A_{ijt}. Enrollment and document counts alone therefore give the conservative outer bounds $0 \leq B_t \leq N_t$. Zero is an information limit, not a finding that no student contributed. These bounds are not claimed to be sharp after all available byline information is considered.

If every listed work is assumed to have at least one author enrolled in its assigned course year, then $1 \leq B_t \leq N_t$ whenever $K_t > 0$. The lower bound is one rather than K_t: the same student could coauthor every paper. Verified author identities, enrollment records, and contribution dates would be needed to narrow these limits and relate authorship to course activity.

Assessment was examined separately. We recorded the rubric's criteria and response categories and checked whether the published grade intervals cover every integer percentage from 0 to 100. We did not infer a rule connecting rubric ratings to final grades or reconstruct numeric scores from a plot. The absence of individual assessments and a defined comparison design also precludes estimating instructional effects. Causal interpretation would require evidence about selection and confounding beyond the publication series [22].

III. Results

A. Eighteen Publications and Five Enrollment Entries

The 18 entries resolve to 18 distinct DOIs, although they contain only 16 different author-year labels. P05 and P06 share the label Zhang et al. (2022) but concern BAD/PARP investigations in endometrial and ovarian carcinoma, respectively. P12 and P17 share Huang et al. (2024) but refer to a TFF3/PVRL2 investigation and a synthesis of stem-like traits in triple-negative breast cancer. Merging entries by these short labels would discard two distinct works, undercounting the corpus by 11.11%. Table 1 identifies all 18 papers.

Table 1: DOI-linked publication register

ID	Course row	Reference year	Subject and identifying citation	Activity	Focus
P01	2021	2021	Mitochondrial oncogenic transformation	Synthesis	Cancer
P02	2021	2021	Long non-coding RNA in ovarian cancer	Synthesis	Cancer
P03	2022	2022	Machine learning in endometrial cancer	Synthesis	Cancer
P04	2022	2022	CXC chemokines in ovarian cancer	Synthesis	Cancer
P05	2022	2022	BAD/PARP in endometrial carcinoma	Investigation	Cancer
P06	2022	2022	BAD/PARP in ovarian carcinoma	Investigation	Cancer
P07	2023	2024	Growth hormone in cancer	Synthesis	Cancer
P08	2023	2023	Neovascularization in ovarian cancer	Synthesis	Cancer
P09	2023	2024	Rubusoside in Parkinson disease	Investigation	Other biomedical
P10	2023	2023	TFF3 inhibition in mammary carcinoma	Investigation	Cancer
P11	2024	2024	UCP1 in obesity and neurodegeneration	Synthesis	Other biomedical
P12	2024	2024	TFF3/PVRL2 co-targeting	Investigation	Cancer
P13	2024	2024	LRP1 expression in ovarian cancer	Investigation	Cancer
P14	2024	2024	RTK/BAD inhibition in breast cancer	Investigation	Cancer
P15	2024	2024	Mitomycin/BAD in cervical cancer	Investigation	Cancer
P16	2024	2024	MEK/BAD in pancreatic cancer	Investigation	Cancer
P17	2024	2024	Stem-like traits in breast cancer	Synthesis	Cancer
P18	2024	2024	SHH signaling in endometrial cancer	Investigation	Cancer

The annual entries contain 5, 15, 14, 12, and 15 registrations from 2020 to 2024 (Table 2). Together they represent 61 registrations, of which 56 belong to rows with available publication counts. Enrollment rose after 2020, declined for two years, and returned to 15 in 2024. The record does not explain this variation.

The unavailable 2020 count prevents a numerical publication comparison with later years. Although the course account's graph places the 2020 mark at zero, its table explicitly records the information as unavailable. The 2024 graph appears to place the count near seven, whereas its table lists eight identifiable papers. We use the enumerated entries for the analysis and do not infer a reason for either graphical discrepancy.

Table 2: Course registrations and publication entries

Course row	Registrations	Works	Documentary status
2020	5	NA	Publication count not available
2021	15	2	No in-progress annotation
2022	14	4	No in-progress annotation
2023	12	4	No in-progress annotation
2024	15	8	Class in progress
2021–2024	56	18	Rows with available publication entries

Enrollment and course-status entries are credited to Bhardwaj et al., Table 2, p. 8. Works are counted from the DOI-linked register. NA is retained as unavailable, not converted to zero.

B. Annual Totals Depend on the Year Field

The course-row totals are 2, 4, 4, and 8, compared with 2, 4, 2, and 10 by printed reference year. Sixteen papers occupy the same year under both conventions; P07 and P09 account for the difference (Figure 1). Thus, 88.89% of records agree in year allocation, a descriptive proportion rather than a measure of attribution accuracy.

The final year's share of the corpus rises from 44.44% to 55.56% when the printed reference year is used. The apparent increase from 2023 to 2024 doubles from four to eight works, even though no paper has been added. Both displaced papers were available online during 2023, so the shift cannot be interpreted simply as delayed publication. It reflects the year field chosen for counting.

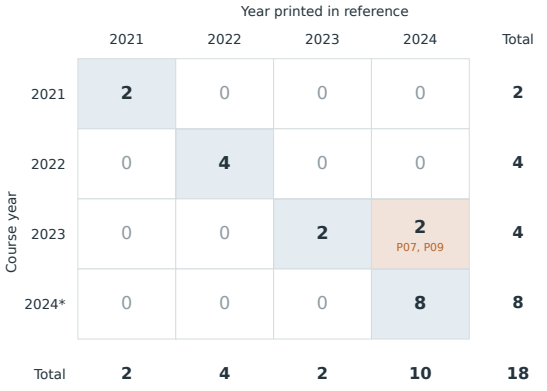


Figure 1: Allocation of the same 18 publications by course year and printed reference year. Each cell gives a document count; row and column totals show the resulting annual distributions. P07 and P09 belong to the 2023 course row but carry 2024 references. Their placement does not establish publication delay: both have evidence of online availability in 2023. The asterisk marks the course listed as in progress

C. Investigations Account for the Endpoint Increase

The corpus contains ten primary investigations and eight literature syntheses. Every course row contains two syntheses; investigation counts are zero, two, two, and six. Investigations therefore make up 0%, 50%, 50%, and 75% of the annual totals (Figure 2). The six-work increase between 2021 and 2024 is entirely within the investigation category.

Sixteen papers focus on cancer. The exceptions are the Parkinson disease investigation (P09) and the UCP1 synthesis concerning obesity and neurodegeneration (P11). Crossing topic with activity gives nine cancer-focused investigations, seven cancer-focused syntheses, and one other biomedical work in each activity category (Figure 3). Cancer-focused papers represent 88.89% of the corpus.

These classifications describe different properties. Restricting the corpus to cancer removes one investigation and one synthesis, whereas restricting it to investigations retains one paper outside oncology. The two broader biomedical papers may still have educational relevance, but the list cannot be described as consisting entirely of cancer-focused investigations.

Figure 2: Research activity represented in each course year. Segment labels give counts of literature syntheses and primary investigations, and labels above the bars give totals. Synthesis remains at two works per year; all six additional works between 2021 and 2024 are investigations. Categories describe products, not the amount or quality of student participation. The 2024 course was listed as in progress

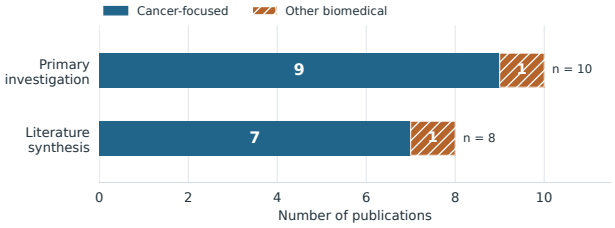


Figure 3: Publication counts by research activity and topic. Bar length gives the number of works, with cancer-focused and other biomedical work distinguished by fill and hatching. The two other biomedical works are P09 (a Parkinson disease investigation) and P11 (a synthesis concerning UCP1, obesity, and neurodegeneration). Topic and research activity are coded separately

D. Enrollment Quotients and Inclusion Decisions

The annual quotients are 13.33, 28.57, 33.33, and 53.33 works per 100 registrations. The last value is eight papers divided by 15 registrations and multiplied by 100; it does not identify eight student authors. Pooling all four rows gives 32.14.

Excluding the in-progress 2024 course leaves ten papers and 41 registrations, reducing the pooled value to 24.39. Table 3 reports the other restrictions.

Some restrictions produce equal totals with different meanings. Ten investigations across all four rows and ten works of either activity across 2021–2023 have different denominators and answer different questions. Likewise, the 16 cancer-focused papers happen to equal the erroneous total obtained by merging repeated author-year labels. A total alone does not reveal its inclusion rule.

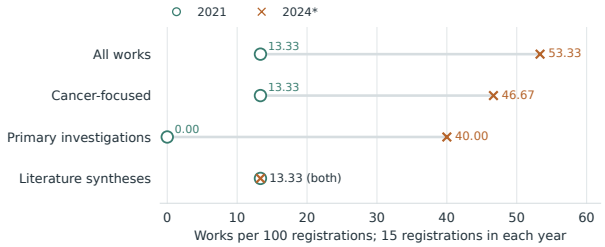
Table 3: Publication counts under alternative restrictions. The final column gives works per 100 registrations, not a percentage of students; the restrictions overlap

Restriction	Works	Registrations	Works per 100
All listed works, 2021–2024	18	56	32.14
Exclude in-progress 2024 row	10	41	24.39
Cancer-focused works only	16	56	28.57
Primary investigations only	10	56	17.86
Cancer-focused investigations only	9	56	16.07
Literature syntheses only	8	56	14.29

The one-work omission ranges are 6.67–13.33, 21.43–28.57, 25.00–33.33, and 46.67–53.33 (Figure 4a). The 2024 quotient remains above every earlier full-count value. The ordering of the middle rows is less stable: omitting one 2023 paper gives 25.00, below the complete 2022 value of 28.57. These comparisons describe sensitivity to inclusion, not statistical differences between cohorts.

With 15 registrations at both endpoints, the all-work quotient increases from 13.33 to 53.33 and the cancer-focused quotient from 13.33 to 46.67. Investigations increase from zero to 40.00 works per 100 registrations, while synthesis remains at 13.33 (Figure 4b). No fold change is calculated from the zero investigation count. The omission check does not imply that any record is erroneous; all 18 remain in the main analysis.

(a) Single-work omission



(b) Equal-enrollment endpoint comparison

Figure 4: Sensitivity of publication quotients to inclusion decisions. (a) Open markers omit one work from the indicated course row; filled markers retain every listed work. Connecting segments are deterministic comparisons, not confidence intervals. (b) The 2021 and 2024 rows each contain 15 registrations. The two years are compared under four overlapping content restrictions; these categories must not be added together. The asterisk denotes the in-progress 2024 course

E. The Number of Enrolled Authors is not Identified

Without verified enrollment-to-author links, the outer bounds on enrolled authors are 0–15, 0–14, 0–12, and 0–15. Assuming at least one enrolled author on every listed paper changes the lower bound to one in each year (Figure 5). The conditional lower fractions are therefore 6.67%, 7.14%, 8.33%, and 6.67%, not the publication quotients.

The bounds remain broad because the same student could contribute to several papers and several students could share one paper. They express a missing relationship between documents and people, rather than imprecision in the document count. No hypothetical roster is needed to demonstrate that distinction.

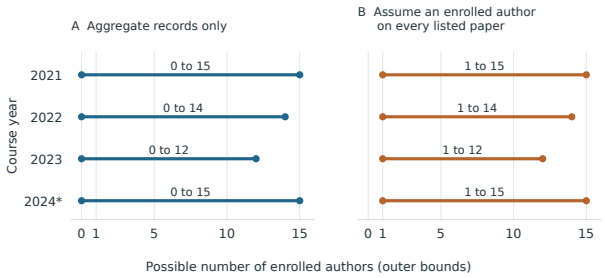


Figure 5: Conservative outer bounds on the number of enrolled authors. With no verified enrollment-to-author links, the bounds run from zero to the annual enrollment. Assuming that every listed work includes at least one enrolled author raises the lower bound to one, because the same student could appear on several papers. The horizontal spans are algebraic limits, not estimated distributions or confidence intervals; available byline information could impose further restrictions. The asterisk denotes the in-progress course

F. Assessment Records Describe an Instrument, not Learning Gains

The presentation rubric has ten criteria: five for presentation skills and five for content organization, each with five response categories. Completed ratings, assessor weights, rules for missing ratings, and a link to final percentage grades are unavailable. The grading schedule contains nine named categories but assigns no category to an integer score of 60; decimal rounding is also unspecified. Table 4 summarizes what each material supports.

Assigning 60 to a grade or summing rubric items would supply rules that the published account does not state. We therefore retain the boundary omission and do not calculate grade means, reliability coefficients, or learning gains from these materials.

IV. Discussion

A. Counting Choices Change the Account of Scholarly Output

Three findings explain why this small publication list deserves careful handling. First, two repeated citation labels identify four separate papers. Second, choosing printed reference year rather than course year doubles the apparent final annual increment. Third, the increase between the first and last course rows consists entirely of investigations, while synthesis remains constant. Each result can be traced to individual records; none requires a fitted model.

These are accounting findings with consequences for educational interpretation. An undifferentiated total conceals the balance between research activities and can suggest a more uniform change than the papers support. Reporting the unit, inclusion rule, and year convention follows the broader principle that quantitative indicators must remain open to inspection [14]. Here, the DOI-linked register makes that inspection practical because readers can locate every record responsible for a changed total.

The activity distinction should not become a hierarchy of educational value. Producing a synthesis may require close reading, comparison of conflicting findings, and repeated revision. An investigation may offer different opportunities for computational or experimental work. Course-based research literature emphasizes those practices and experiences rather than publication genre alone [5], [6]. Two syntheses in each row do not establish constant student effort, just as no listed investigation in 2021 does not establish an absence of investigative activity.

B. Enrollment Normalization Leaves Authorship Unresolved

Dividing publication counts by enrollment accounts for one feature of course size. It does not identify participating students. The equal enrollment in 2021 and 2024 shows that the endpoint quotient difference comes from the listed papers, but leaves open the roles of research-group membership, preexisting projects, authorship arrangements, and observation time. Those circumstances are particularly relevant to graduate education, where course participation may overlap with supervised research.

The outer bounds identify the records needed to move beyond document counting. A roster defines eligible students; verified author matches identify who appears on each paper; contribution statements describe their work; and dates relate that work to the course. Author identifiers [15] and contributor-role reporting [17] can assist different parts of this process. Neither replaces enrollment verification.

An unresolved link should not be read as evidence that the published course associations are false. The account may reflect substantial student involvement. The available material simply does not establish how that involvement was distributed. This distinction allows recognition of the documented publications without assigning equal credit to every registered student or treating each paper as a different student's achievement.

C. Educational Claims need Corresponding Observations

The course's presentation and peer-feedback activities offer plausible routes to learning. Testing those routes requires evidence about the activities as students experienced them. Peer-assessment research examines arrangements and academic outcomes [11], and the variation reported in feedback studies cautions against treating every opportunity for feedback as equivalent [13]. A blank rubric identifies intended criteria; completed ratings, scoring procedures, and assessed work are needed to evaluate its use.

Research ownership and independent learning require similar care. Self-regulated learning involves goal setting, monitoring, and strategy use [12]; ownership can be assessed with instruments designed for that purpose [8]. Authorship may be related to these experiences, but the relationship cannot be reconstructed from a publication list. Program-level work such as the SEA-PHAGES study illustrates the additional information obtained when research products are examined alongside student learning and program support [9].

The undergraduate evidence reviewed here helps distinguish types of educational observation. It does not provide the missing measurements for this graduate course. Our findings therefore leave the effectiveness of its teaching approach open. A future evaluation would need direct student outcomes and an explicit design addressing selection and confounding, rather than a causal interpretation of the publication trajectory [22].

D. Time Conventions and a Practical Reporting Approach

The in-progress 2024 row has substantial influence on the pooled quotient. Retaining it describes the complete published list; excluding it describes the earlier rows. Neither choice establishes equal follow-up across years, and neither predicts the final output of a completed cohort. Its status should accompany any summary that includes it.

The two papers available online in 2023 but cited as 2024 make a related point. Course participation, project initiation, acceptance, online release, and issue publication are different events. An evaluation should choose the date relevant to its question and record it consistently. In this case, the two available year fields support a comparison of reporting conventions, not a reconstruction of project histories.

For course reporting, the most useful starting point is a publication register that records a stable identifier, the asserted course association, the chosen date convention, and the content classification. Claims about participation then require a

Table 4: Assessment evidence and admissible interpretation

Material	Documented information	Interpretation supported
Presentation rubric	Ten items; five response categories; two groups of five items	Description of intended presentation assessment
Grading schedule	A+ through C and Fail; integer 60 has no stated category	Description of published boundaries, with the uncovered boundary retained
Grade plot	Plotted grade marks and a mean trace without a numeric score table	Visual description only; no recalculated means or learning gains
Publication register	Eighteen DOI-resolved works linked to course rows	Document counts and composition, not individual mastery

separate, verified link to enrolled contributors. Claims about learning require assessment evidence. Contributor descriptions can make individual credit more precise [16], while machine-readable records and code make the counts reusable [19], [20]. Reproducibility checks whether the stated rules yield the reported results; it cannot by itself establish that a chosen indicator measures learning.

V. Limitations

This analysis concerns one course and a bounded list of named papers. It cannot establish that the list captures every output or research activity. Selection into the course, repeat registrations, supervision, authorship eligibility, and observation periods are not documented. The findings therefore describe this corpus and cannot estimate participation across courses or compare equivalent student cohorts.

Content coding was not independently duplicated. Titles, abstracts, and available article information support the stated categories, but a more detailed taxonomy could require full-text adjudication. A broader definition of oncology might also classify the two other biomedical papers differently. The register permits such alternatives to be examined without changing publication identity. The student-authorship bounds use aggregate information only and may be wider than bounds incorporating verified byline identities.

The reference-year comparison does not consistently measure first-online publication. The complete corrigendum for P09 remains unavailable, so its possible implications for classification require author review. No biomedical results from that paper enter the calculations. The lack of completed assessment records prevents instrument validation or grade reconstruction. These limits concern information absent from the materials; additional statistical analysis of the same counts would not resolve them.

VI. Conclusion

The course record contains 18 distinct publications: ten investigations and eight syntheses. Two shared author-year labels obscure document identity, and two differences between course and reference years change the annual distribution. The six-work increase between the first and last course rows comes entirely from investigations. Including the in-progress 2024 course also raises the pooled publication quotient appreciably.

These results support a more precise description of scholarly output. They do not identify how many enrolled students published or whether their learning improved. Course publication lists are most informative when document identity, counting conventions, student contribution, and assessment evidence are reported as separate parts of the educational record.

Author Contributions

Both authors contributed equally to the conception, development, and preparation of the manuscript. Both authors have read and approved the final version of the manuscript for publication.

Data Availability

The analysis is based on publicly available aggregate course descriptions and bibliographic records. The study did not involve participant recruitment, direct participant contact, intervention, or access to identifiable student records. No institutional ethics approval or exemption is claimed on behalf of any author or institution.

Conflicts of Interest

The authors declare that there are no conflicts of interest related to this work.

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Declaration of Generative AI and AI-Assisted Technologies in the Preparation of the Manuscript

Generative artificial intelligence tools were used solely to assist with language editing and revision of the manuscript. The authors subsequently reviewed and verified all AI-assisted content and take full responsibility for the accuracy, integrity, and final content of the manuscript.

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