

Research-Based Approach in Business Courses: An Anchor for Industrial Design Students' Complex

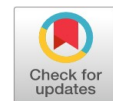
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Abstract: The study intends to determine and tailor-fit a teaching methodology that espouses a higher level of learning considering concepts in management, marketing, production/operations management. The proponent consolidated a five-year comparative data utilizing a traditional approach in teaching for midterm and a research-based approach for finals among students from 2014 to 2019. The study results provided a remarkable improvement in the students' academic performance given a specific rubric in scoring research outputs with the close monitoring and guidance of the proponent. This evidence supports the researcher's contention that a research-based approach in teaching business is a grounded foundation and an effective preparation for students who will be taking up COMPRES (Industrial Design Thesis) as a capstone requirement for graduation. Business research provides the basic business framework and model that students can work with and develop to make their business ventures thrive in the design industry in the future. It is recommended that courses under the business cluster institutionalize using a research-based approach through a research output as a final requirement for these courses. A review of the current syllabi must also be undertaken to integrate and formulate guidelines and rubrics in conducting and scoring research outputs.

Keywords: Academic performance, Business courses, Industrial design, Research-based teaching

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INTRODUCTION

Research-based teaching is one of the institutionalized versions of inquiry-based learning (Aditomo, Goodyear, Bliuc, & Ellis, 2013; Kinkead, 2003). It provides students a platform for better learning by intertwining teaching in research. Learning in research takes place in various paradigms. Learning for students means acquiring new knowledge by applying important theories associated with their professions.

Giller (2011) asserted that research-based learning is important to universities to fulfill their mission of stimulating, encouraging, and supporting learners to develop knowledge, insights, attitudes and skills expected of them in their respective professional careers. Research does not only provide a starting point but develops a critical and analytical stance on the current situation of the market where designers offer their concepts whether for manufacturing or consultancy. Higher educational institutions nowadays develop students beyond the confines of the classrooms and immerse students through thorough investigation and inquiry of design concepts, its impact on society, and the possibility of making a profit out of it. Elen, Lindblom-Ylance, and Clement (2007) further supported this claim opining that engaging students in research develops high-value competencies, such as critical attitude, to think independently and be able to express their thoughts clearly.

In a study conducted by J. Lannu (2015), it was found out that the level of research competencies of students is at its declining stage. With the availability of learning materials online, students tend to rely on readily available information and simply focus on complying with academic requirements. This result validated the gap that the proponent attempted to reconcile to propose a relevant and effective intervention to improve the research skills of students. Moreover, J. E. Lannu and Nobleza (2017) contend

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that industrial designers provide a remarkable assessment of how they perceive their level of competencies making design professionals employable. However, most of the designers are employed on a project-based contracts and most of them have their own design firms and consultancies. This in itself provides an opportunity for this research to develop a strategy in improving the business research competencies of students to strengthen their foundation and improve the quality of their design proposals, specifically its business aspect. Furthermore, a study by [J. E. Lannu \(2018\)](#) provides an overview of how receptive industrial design students are to business programs making this research more relevant to implement methodologies that can improve learning.

The Industrial Design Program of the De La Salle-College of Saint Benilde orientation of its graduates is leaning towards entrepreneurship. Students are introduced to the basic concepts of business to inculcate and reinforce in them an orientation that would lead them towards building their own business empires and not just becoming industry fillers. In order to realize this track, students must be able to have a strong foundation in business and be able to apply these concepts in developing a thesis that presents realistic and feasible design concepts.

Objectives of the study

1. Determine the academic performance of Industrial Design students before and after the implementation of research-based teaching methodology.
2. Validate the significance of the research-based teaching methodology in improving students' academic performance.
3. Propose syllabi review and modification to integrate the research-based methodology in the business programs.

Statement of the problem

The research aimed at establishing significant improvement in the academic performance of students by implementing a research-based approach in teaching. Specifically, it sought to answer the following inquiries:

1. How do the Industrial Design students from 2014-2019 differ in academic performance before and after the implementation of the research-based approach in the following programs?
 - Management in Design Practice
 - Principles of Marketing in Design Practice
 - Strategic Marketing in Design Practice
 - Production/Operations Management in Design Practice
2. Is there a significant difference in how students perform when all subjects in the business programs are compared?
3. What generalizations can be inferred from the collated data to address the challenges encountered in the business aspect of the students' design proposals to successfully defend their COMPREX (Thesis)?

Research hypothesis

Students will improve their academic performance once research-based approach as a form of teaching methodology is implemented in the business courses/programs.

CONCEPTUAL FRAMEWORK

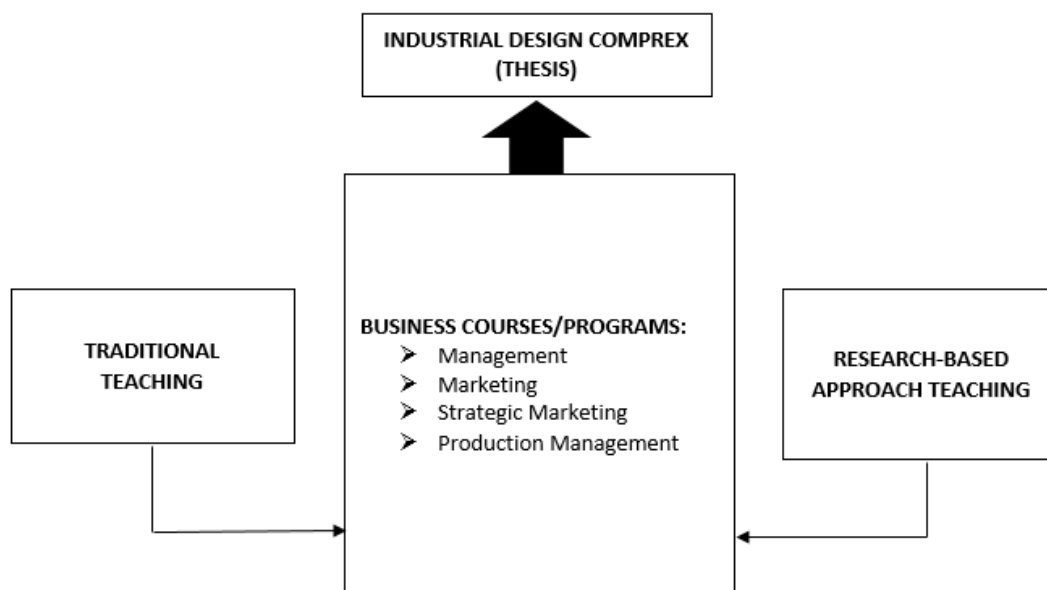


Figure 1. Conceptual framework

The fundamental of design is artistic skills. However, one cannot deny the fact that if these designs do not translate to a feasible business venture, then it becomes a futile endeavor. The academic years of students become the very foundation of their profession. The capstone requirement of the Industrial Design Program is COMPREX or thesis. This requirement intertwines design and business skills, and often the latter is not given the much needed focus; hence, students are challenged on how to propose a feasible business integrating their conceptualized designs.

This framework was designed to assess the effectiveness of an intervention mainly to improve the business know-hows of would-be industrial design entrepreneurs by introducing a research-based approach teaching methodology in the four core business programs: management, marketing, strategic marketing, and production/operations management which will serve as a foundation of students under the Industrial Design Program in conceptualizing and defending their theses.

METHOD

This study is an action research using a specific intervention and analytical research methods designed to determine the effectiveness of a teaching methodology through a statistical comparison of data. The proponent collated five-year data on the academic performance of students under the Industrial Design Program from AY 2014-2015 to AY 2018-2019 with an average student number of forty (40) per class. During the midterm, the traditional teaching methodology was utilized by the proponent by providing lectures and usual classroom activities and quizzes. However, during the final term, a research-based approach was implemented by providing research guidelines and rubrics in providing a point system for the outputs submitted. Students were introduced to the basic foundations of business research and were encouraged to use their initial design concepts in the preliminary stage of their thesis.

The *t*-Test two way was used to determine the significant improvement before and after the implementation of the intervention and on the other hand, the Analysis of Variance (ANOVA) was employed to compare the overall performance of students per subject.

RESULTS AND DISCUSSION

For establishing the effectiveness of the research-based approach as a teaching methodology in the Industrial Design Program, data from 2014-2019 were utilized. After relevant statistical treatment, the results reveal significant findings.

Table 1: Student performance in management in design practice (MANADES)

| | Traditional | Research-Based |
|----------------------------|-------------|----------------|
| Mean | 83.85 | 88.29 |
| Variance | 178.03 | 108.51 |
| Observations | 72 | 72 |
| Level of Significance | 0.05 | |
| <i>df</i> | 71 | |
| <i>t</i> Stat | 3.37 | |
| <i>t</i> Critical two-tail | 1.99 | |

As to the performance of the Industrial Design students in Management in Design Practice, it was revealed that the impact of the implementation of the research-based approach teaching methodology was significant with a *t*-value of 3.365691479 higher than the critical value of 1.9934943368 with a level of significance of 0.05.

It can be inferred that students have performed better in terms of academic performance after its implementation. Management subject provides the basic foundation of all business subjects mainly in the functional areas and decision-making. The subject provides the students a wide spectrum of concepts and theories that can be applied to all fields. The research required in this subject dug deeper into the management functions and leadership styles that are necessary to carry out one's function of increasing the firm's value.

Research in management provides students with a platform to enhance their critical thinking ability which is imperative in decision-making, especially in the corporate world. As opined by [Cooper and Schindler \(2008\)](#), it provides systematic inquiry that provides information in managerial decisions. Specifically, the authors gave emphasis to the processes of planning, acquiring, and disseminating relevant data and insights to maximize business performance. The result and implementation of research as a capstone requirement is a validation of the importance of management processes which is necessary for ensuring grounded or anchored decisions.

Table 2: Student's performance in principles of marketing in design practice (MARKDES)

| | Traditional | Research-Based |
|----------------------------|-------------|----------------|
| Mean | 88.14 | 90.56 |
| Variance | 31.79 | 19.99 |
| Observations | 140 | 140 |
| Level of Significance | 0.05 | |
| <i>df</i> | 139 | |
| <i>t</i> Stat | 4.46 | |
| <i>t</i> Critical two-tail | 1.98 | |

As to the performance of the Industrial Design students in Principles of Marketing in Design Practice, it was revealed that the impact of the implementation of the research-based approach teaching methodology was significant with a *t*-value of 4.462821678 higher than the critical value of 1.977177724 with a level of significance of 0.05.

The result is a clear manifestation of how students' performance improved in the specific subject. Marketing is an introduction to the basic concept of defining the concrete target market and aligning marketing efforts based on their classification specifically the market's demography. Students are able to fully understand the creation of value and theories that could provide a deeper understanding of customers' behavior and the forces that mobilize urgency in creating a need for product design. This is the first step towards deciphering the market, hence, making students more knowledgeable as they base their design concepts on the current need of the market and not just simply a creative idea but a functional and financially feasible one.

Marketing research is one of the more important activities that a business must undertake.

Successful businesses conduct researches frequently as a form of leverage against competitors. Regardless of whether a business is at its starting phase or towards its expansion stage, research in the field of marketing is vital (Boris & Sergey, 2018; Oud, 2004; Visser, 2016). It must be understood that marketing is the heart of any business as it provides information that is necessary for positioning the business towards profitability and marketing is interconnected with all the functional areas of the firm.

Table 3: Student's performance in strategic marketing in design practice (DSTRAMA)

| | Traditional | Research-Based |
|----------------------------|-------------|----------------|
| Mean | 85.73 | 90.06 |
| Variance | 49.71 | 61.50 |
| Observations | 91 | 91 |
| Pearson Correlation | 0.38 | |
| Level of Significance | 0.05 | |
| <i>df</i> | 90 | |
| <i>t</i> Stat | 4.95 | |
| <i>t</i> Critical two-tail | 1.99 | |

As to the performance of the Industrial Design students in Strategic Marketing in Design Practice, data showed that the impact of the implementation of the research-based approach teaching methodology was significant with a t-value of 4.950499668 higher than the critical value of 1.986674541 with a level of significance of 0.05.

The result is a clear indicator of how well students perform as a research-based approach is implemented. Strategic marketing is an advanced marketing subject that focuses on strategies, such as segmentation, target marketing, positioning and value proposition. Students are given the opportunity to benchmark their thesis proposals through primary data gathering, secondary data utilization, and the use of internal and external market environment analysis. The research outputs provided an in-depth and realistic analysis of the marketability of their design proposals and how variables such as marketing costs and pricing affect actual marketing strategies. Students were also required to provide a budget proposal and control systems in the implementation of their respective strategies.

The success or failure of any firm in the industry is vastly dependent on the marketing strategies implemented by the company. One of the major reasons for the failure of a business is greatly attributed to the lack of it (Dewi, M., Zila, Zaidatulnisha, & Fazrul Radzi, 2018; Michael & Ogwo, 2013). It was defined that marketing strategy is an action that leads to the companies' objectives and vision. Competitive advantage is achieved by the company if a strategy is adopted, hence, research is necessary before the formulation of any action plan.

Table 4: Student's performance in production management in Design Practice (DPRODMA)

| | Traditional | Research-Based |
|----------------------------|-------------|----------------|
| Mean | 80.57 | 89.14 |
| Variance | 54.51 | 21.84 |
| Observations | 105 | 105 |
| Level of Significance | 0.05 | |
| <i>df</i> | 104 | |
| <i>t</i> Stat | 3.01 | |
| <i>t</i> Critical two-tail | 1.98 | |

As to the performance of the Industrial Design students in Production Management in Design Practice, it was revealed that the impact of the implementation of the research-based approach teaching methodology was significant with a t-value of 3.012210344 higher than the critical value of 1.983037526 with a level of significance of 0.05.

The data showed a significant improvement in the academic performance of students. Production management provides students with an overview of the operations side of a manufacturing business

where designs are incorporated to produce specific products. Quality and logistics are the foundations of this subject which is a necessity to ensure cost efficiency and profit maximization for the business. The students were tasked to research on systems used by companies in the manufacturing sector to determine its efficiency and the quality it provides. Productivity through labor force and volume production were also among the variables assessed by students in presenting their outputs.

The results go against the findings of scholars as well as research being irrelevant to most management practitioners (Fisher, 2007). The improvement of students' performance as they embark on their research endeavors says otherwise by realizing the value of research to any business organization. Production/Operations management is an encompassing field that deals not just with the final output but also the labor, processes and quality that go with it. Therefore, it is imperative to note the value of research in all facets of business operations.

Table 5: Overall student's performance in business programs

| Groups | Count | Sum | Average | Variance | | |
|---------------------|----------|----------|---------|----------|----------|------------|
| MANADES | 72 | 6357.35 | 88.29 | 108.51 | | |
| MARKDES | 140 | 12678.60 | 90.56 | 19.99 | | |
| DSTRAMA | 91 | 8195.20 | 90.06 | 61.50 | | |
| DPRODMA | 105 | 9569.50 | 89.14 | 21.84 | | |
| Source of Variation | SS | df | MS | F | p-value | F critical |
| Between Groups | 373.42 | 3 | 124.47 | 2.749608 | 0.042514 | 2.626992 |
| Within Groups | 18288.70 | 404 | 45.27 | | | |
| Total | 18662.11 | 407 | | | | |

The overall performance of students per subject is presented in a table above. It presents the four major business programs offered under the Industrial Design program. Statistical analysis using ANOVA shows that all subjects have minimal differences in terms of performance with an F -value of 2.749608 which is slightly higher than the F -critical value of 2.626992. This is validated by the p -value of 0.042514 lower than the significance level of 0.05.

The academic performance of students after the implementation of the research-based approach teaching methodology has been consistent among all the four subjects, which validates that the intervention was effective. The research requirements served as a first-hand experience in conceptualizing marketing strategies through proper evaluation of cost, pricing, and productivity and formulating sound decision-making for the business as an offshoot of the thesis presented as a final requirement for graduation.

With the results of the study, it proves that adopting a research-based approach method in teaching business programs is effective. For one, students were equipped with the necessary skills for identifying problems of a firm and effectively addressing them (Hine, 2013; Dasig et al., 2017).

CONCLUSION

1. Students' academic performance improved after the implementation of a research-based approach teaching methodology in the following business courses/programs: management, principles of marketing, strategic marketing and production/operations management.
2. The students' academic performance after the implementation of a research-based approach teaching methodology was consistent making it conclusive that the intervention was effective.
3. The research outputs may complement the business side of the students' design concepts which are necessary for conceptualizing students' COMPREX (Thesis).
4. The research-approach teaching methodology provided a platform for students to collaborate and seek information to determine the feasibility of their design concepts.

RECOMMENDATIONS

1. Review current business program syllabi to align and integrate a research-based approach teaching methodology.

2. Calibrate the OBE-syllabi Course Learning Outcomes (CLO) requiring research outputs.
3. Develop a unified research guideline and rubrics in scoring business research outputs.
4. Intensify research culture among faculty members and students by providing research workshops and seminars.
5. Institutionalize student-research colloquium to present design concepts in a formal forum.
6. Conduct tracer studies to monitor if design concepts by Industrial Design graduates materialized into actual business ventures or have been adapted for manufacturing.

REFERENCES

- Aditomo, A., Goodyear, P., Bliuc, A.-M., & Ellis, R. (2013). Inquiry-based learning in higher education: principal forms, educational objectives, and disciplinary variations. *Studies in Higher Education*, 38(9), 1239-1258. doi:<https://doi.org/10.1080/03075079.2011.616584>
- Boris, T. E., & Sergey, S. I. (2018). Marketing of innovative startup. *International Journal of Business and Economic Affairs*, 3(3), 91-100. doi:<https://doi.org/10.24088/ijbea-2018-33001>
- Cooper, D. R., & Schindler, P. S. (2008). *Business research methods*. New York, NY: McGraw-Hill.
- Dasig, D. D., Jr., Tadeo, C., Sabado, D., Cervantes, M. E., Mansueto, M., Pahayahay, A. B., ... Traballo, R. (2017). Application of participatory research model in the college research and development program. *International Journal of Business and Economic Affairs*, 2(2), 135-148. doi:<https://doi.org/10.24088/ijbea-2017-22007>
- Dewi, I. A., M., Zila, Z. A., Zaidatulnisha, A. J., & Fazrul Radzi, S. (2018). Would marketing capability and network resource influence business performance? The case of Bumiputera on-line entrepreneurs in Malaysia. *Journal of Administrative and Business Studies*, 4(4), 196-205. doi:<https://doi.org/10.20474/jabs-4.4.2>
- Elen, J., Lindblom-Ylanne, S., & Clement, M. (2007). Faculty development in research-intensive universities: The role of academics' conceptions on the relationship between research and teaching. *International Journal for Academic Development*, 12(2), 123-139. doi:<https://doi.org/10.1080/13601440701604948>
- Fisher, M. (2007). Strengthening the empirical base of operations management. *Manufacturing & Service Operations Management*, 9(4), 368-382. doi:<https://doi.org/10.1287/msom.1070.0168>
- Giller, A. ., P. (2011). Integrating research into the undergraduate curriculum: A case study from Ireland. In *EUA Conference, aarhus, denmark*.
- Hine, G. S. C. (2013). The importance of action research in teacher education programs. *Issues in Educational Research*, 23(2), 151-163.
- Kinthead, J. (2003). Learning through inquiry: An overview of undergraduate research. *New Directions for Teaching and Learning*, 2003(93), 5-18. doi:<https://doi.org/10.1002/tl.85>
- Lannu, J. (2015). Outcomes-based education integration: Assessing business administration students level of awareness and readiness. In *The International Educators Conference*, Tuguegarao, Philippines.
- Lannu, J. E. (2018, aug). Assessing the receptiveness of industrial design students to business programs: A framework for reinforcement and implementation. *International Journal of Business and Administrative Studies*, 4(4), 160-166. doi:<https://doi.org/10.20469/ijbas.4.10003-4>
- Lannu, J. E., & Nobleza, M. F. L. (2017). The impact of competitiveness on the employability of Philippines industrial designers: Streamlining the program with the international market. *International Journal of Business and Administrative Studies*, 3(1), 31-36. doi:<https://doi.org/10.20469/ijbas.3.10005-1>
- Michael, N., & Ogwo, E. (2013). Trade sales promotion strategies and marketing performance in the soft drink industries in Nigeria. *International Journal of Marketing Studies*, 5(4), 96-109. doi:<http://dx.doi.org/10.5539/ijms.v5n4p96>
- Oud, J. (2004). *Market research versus marketing research*. Retrieved from <https://bit.ly/2tWBPvD>
- Visser, J. H. (2016). Bases of market segmentation success: A marketing decision makers perspective. *International Journal of Business and Administrative Studies*, 2(3), 75-80. doi:<https://doi.org/10.20469/ijbas.2.10004-3>