

Determining the Most Critical Pedagogical Approach for Principle of Economics (ECO120) Through Analytic Hierarchy Process (AHP) Analysis in Higher Education

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ABSTRACT

This study aims to identify the most critical pedagogical approach for teaching the Principles of Economics (ECO120) in higher education by applying the Analytic Hierarchy Process (AHP) method. With the growing complexity of economic concepts and the need for effective instructional strategies, it is essential to evaluate various teaching methods to enhance student understanding and engagement. Five prominent pedagogical approaches—constructivist, collaborative, inquiry-based, integrative, and reflective—are analysed to determine their relative importance in an ECO120 classroom. AHP, a structured decision-making tool, is employed to compare these approaches by using pairwise comparison, a systematic process in which each element is compared with every other element in terms of relative importance, typically using a scale ranging from 1 to 9. This method is used to quantify subjective judgments and convert them into a numerical form that can be analysed mathematically. The findings reveal that the collaborative approach ranks as the most critical, followed by the constructivist approach, which emphasizes active knowledge construction. Inquiry-based, integrative, and reflective approaches occupy the third, fourth, and fifth positions, respectively. These results suggest that a student-centred, interaction-driven pedagogy is most effective for fostering comprehension in introductory economics courses. The study provides actionable recommendations for educators to optimize their teaching strategies, thereby improving the overall quality of economics education in higher learning institutions.

Keywords: Pedagogical Approaches, Economics Education, Analytic Hierarchy Process (AHP), Collaborative Learning, Constructivist Approach, Higher Education, ECO120

INTRODUCTION

In recent years, educational pedagogy has shifted towards student-centred learning methodologies, prioritizing the cultivation of critical thinking, problem-solving skills, and the practical application of information. This transition is especially apparent in fields such as economics, where a profound comprehension of abstract principles and practical application is crucial. Diverse pedagogical frameworks, including constructivist, collaborative, inquiry-based, integrative, and reflective approaches, have been incorporated into educational environments to improve learning experiences. This introduction seeks to examine pedagogical strategies in the context of basic economics courses, such as ECO120, and underscore their importance in cultivating a comprehensive learning environment.

The constructivist method, based on the theories of Jean Piaget and Lev Vygotsky, posits that learners actively construct knowledge through engagement with their environment, rather than passively receiving information (Piaget, 1952; Vygotsky, 1978). In ECO120, a constructivist method promotes the development

of students' comprehension of economic theories and principles through participation in simulations, real-world case studies, and problem-solving exercises. This approach enables students to utilize their prior knowledge, question assumptions, and investigate economic issues interactively. An illustrative constructivist activity in an ECO120 course could have students examining real-time market data to forecast future patterns, so enabling them to contextualize theoretical ideas like supply and demand. This learning method not only improves understanding but also promotes critical thinking as students engage in building their knowledge base. Additionally, constructivism promotes reflection and revision, allowing students to modify their comprehension as they receive new knowledge (Fosnot, 2013).

The collaborative learning approach prioritizes teamwork and collective problem-solving, enabling students to benefit from each other's experiences and viewpoints (Johnson & Johnson, 1999). This instructional approach is especially efficacious in economics education, as collaborative conversations can foster a more profound comprehension of intricate concepts such as market dynamics, economic policy, and resource distribution. In an ECO120 classroom, collaborative learning may manifest as group projects or debates wherein students examine an economic issue and provide viable solutions. Collaborative efforts among students facilitate the exchange of varied perspectives, the discourse of ideas, and the attainment of a more thorough comprehension of the subject matter. Collaboration fosters the cultivation of critical abilities, like communication, negotiation, and cooperation, which are vital in the discipline of economics (Slavin, 2011).

Inquiry-based learning (IBL) advocates for students to engage actively in their education by formulating questions, conducting research, and discovering answers through exploration. This technique, grounded in John Dewey's philosophy of experiential learning, promotes curiosity and profound engagement with content (Dewey, 1938). In the realm of ECO120, inquiry-based education may entail students examining the effects of fiscal policy alterations on economic growth or analysing the origins and ramifications of inflation through autonomous study. This strategy enables students to participate in the learning process more significantly by assuming responsibility for their inquiry, so fostering a deeper comprehension of economic principles. Inquiry-based learning is especially beneficial in economics as it reflects real-world economic research, where experts must continually pursue answers to dynamic concerns regarding markets and policy (Prince & Felder, 2006).

The integrative method promotes the synthesis of knowledge across several fields to address intricate issues (Fogarty, 1991). This method is particularly beneficial in economics education, as comprehending the interrelation between economics and disciplines such as history, politics, and sociology can offer a more comprehensive view of economic concerns. An ECO120 course could adopt an integrative approach by examining the economic ramifications of political events or investigating the historical context of contemporary economic policy. By synthesizing information from other disciplines, students acquire a more sophisticated comprehension of the application of economic principles to real-world contexts, facilitating a more thorough educational experience.

Reflection is an essential element of the learning process, enabling students to engage in critical thinking regarding their educational experiences, evaluate their comprehension, and implement modifications to enhance their knowledge. The reflective pedagogical approach challenges students to contemplate their learning experiences, the methods employed, and the implications for future education (Schön, 1983). In ECO120, reflective methods may include students keeping learning notebooks or participating in group discussions to assess their understanding of economic topics and pinpoint areas for additional investigation. By promoting reflective thinking, instructors can facilitate students' comprehension of economic ideas and improve their ability for self-directed learning. Reflective practices promote lifelong learning, an essential competency in a swiftly evolving economic environment (Moon, 2004).

Each of these educational approaches—constructivist, collaborative, inquiry-based, integrative, and reflective—provides distinct benefits when utilized in the instruction of introductory economics. By actively involving students in the learning process, supporting cooperation, encouraging inquiry, integrating interdisciplinary knowledge, and facilitating reflection, these methodologies collectively establish a robust

framework that can markedly improve students' comprehension of economics. As economics evolves in complexity, integrating several teaching approaches will equip students to effectively address theoretical and practical obstacles in their academic and professional pursuits.

This study aims to identify the most essential instructional strategy for Principles of Economics (ECO120) using Analytic Hierarchy Process (AHP) analysis in higher education. The educational approaches will be ranked in order of importance, with the highest rank indicating the most significant approach and the lowest rank denoting the least significant.

This study is organized into four separate components. Section 2 examines pertinent empirical literature from previous scholars or researchers. Section 3 delineates the approaches utilized in the study. Section 4 delineates the findings, while Section 5 provides conclusions and recommendations.

LITERATURE REVIEW

This section presents key findings from the literature that highlight research gaps in pedagogical approach for education, which focus on higher learning. Numerous research utilizes the pedagogical approaches. Constructivism in higher education prioritizes learner-centered methodologies that foster active knowledge building and critical analysis. This educational framework promotes cooperative learning, critical problem-solving, and reflective cognition (Mishra, 2023). Students participate in collaborative projects, enhancing social skills and research abilities while mitigating shyness (Hussain, 2012). Inquiry-based pedagogy promotes student exploration, enabling learners to investigate many sources, pose inquiries, and implement ideas across different contexts (Khan & Arch, 2020). The constructivist method regards teachers as facilitators, assisting students through scaffolding and fostering opportunities for knowledge building rooted in prior experiences (Kumari, 2022).

Alanazi, (2016) explores the constructivist and constructionist teaching methods, focusing on how learners construct knowledge on prior knowledge schemas. It discusses the critiques of both approaches, their responses, and key components. The paper suggests further research on the effectiveness of each approach to determine the most effective teaching method for educational learning environments. Sharma, (2014) stated that teachers should accept constructivist philosophy and focus on how to learn and construct knowledge. This paper discusses the role of teachers in enhancing constructivist learning and the importance of learner-centered, activity-oriented interactive pedagogical approaches.

Wulf, (2005) explores the use of constructivist pedagogy in teaching computer programming in high school and undergraduate courses. The approach incorporates active learning, collaborative group-based instruction, and cognitive apprenticeships, addressing multiple learning styles and intelligences. Constructivism is a teaching paradigm that promotes critical thinking skills, contrasting with the traditional teacher-centric approach that focuses on memorization (Dagar & Yadav, 2016).

Evtimov and Petrović, (2021) also found that on structivism approach is crucial in early childhood, particularly during the sensitive preschool period, where children's curiosity, desire to learn, and short-term attention are essential.

The paper by Scott and Ghosh, (2016) presents a collaborative pedagogical approach to teaching students in the built environment, involving virtual and face-to-face collaboration for Associated Schools of Construction (ASC) competitions. The approach uses an action research method to enhance students' understanding and behavioral changes, empowering them to explore new horizons. The approach has shown positive results in competition performance and positive feedback from student participants.

K. Sunitha, Dagwale, Kumari and Konsal, (2024) explores the role of instructional design in creating thriving learning environments, focusing on collaborative learning and direct instruction. It highlights the strengths of collaborative learning, such as fostering critical thinking and communication skills, but also

acknowledges challenges like management and assessment. It also highlights the benefits of direct instruction, but acknowledges potential drawbacks like limited engagement and neglect of higher-order thinking skills.

Jacob, (2010) found that collaboration between communication and disciplinary experts is a crucial instructional strategy for imparting disciplinary literacies while the community of inquiry (Hagaman, 1990), emphasizing collaborative learning, is suggested as a pedagogical model for art education, particularly in aesthetics.

Inquiry-based learning (IBL) is an active, learner-centered approach that enhances student innovativeness, academic achievement, and engagement in higher education (Acar & Tuncdogan, 2018; Kori, 2021). Acar and Tuncdogan discussed the importance of inquiry-based learning (IBL) in preparing university graduates for workplace innovation. It suggests that open, discovery-focused, and team-based inquiry can enhance students' skills in innovation. The model links IBL and student innovativeness, with three design elements influencing the relationship. This has implications for higher education research and practice.

McKinney (2014) identified that inquiry-based learning is a learner-centered approach in higher education that involves open-ended research and inquiry. This pedagogical approach requires advanced information literacy, and a UK university's curriculum development projects highlight the need for explicit education on this and support from peers, librarians, and academics in designing inquiry-based learning curricula.

Inquiry-based learning is an active learning method that enhances academic achievement, engagement, and motivation in general education classes. Despite its benefits, it is less commonly used in higher education institutions. Past study by Kori, (2021) discusses examples of implementing inquiry-based learning in higher education at three levels: systematically, separately, and as part of a course. It also highlights the challenges faced at the organization, teacher, and student levels.

Summerlee, (2018) argues that traditional pedagogical approaches in universities are not truly accessible to the broader student population. These approaches favor those who benefit from continuous education, relying heavily on incremental credentialism. This results in inequities and social discrimination. The paper proposes implementing closed-loop, reiterative problem-based learning to create a more socially just approach for students entering university. This approach fosters difficult thinking, research skills, and access to library resources, while also addressing students' expectations and re-thinking the first-year experience.

Azamatovna, (2020) emphasizes the significance of integrative teaching in enhancing education quality through theoretical and practical methods. It highlights the growing need for interdisciplinary approaches to meet scientific, economic, and social demands. The author demonstrates how the implementation of integrative teaching positively impacts students' knowledge and education in general. Innovative pedagogical practices, including mixed approaches with ICTs and digital simulations, promote student engagement and peer learning (Santos, Figueiredo & Vieira, 2019).

Curriculum is crucial for providing quality educational programs and services in higher education, regardless of size or origin. However, the approach to developing curriculum often neglects critical elements like institutional leadership, social trends, industry factors, and government role. Khan and Law, (2015) aims to study literature on an integrative approach to curriculum development for comprehensive knowledge management in higher education institutions, particularly in the USA. In curriculum building, they found it to be crucial to examine several elements, including institutional leadership, social trends, and industry factors, for effective knowledge management.

In the realm of education for sustainable development, comprehensive system, curriculum, and competence-based programmatic strategies, coupled with learner-centered, holistic, and integrative pedagogical methods, are deemed most effective for attaining transformative learning outcomes (Ujeyo & Najjuma, 2022). These

integrated approach are essential for equipping students to address the scientific, economic, and social challenges of a connected world.

Reflective learning has gained prominence in higher education as an effective pedagogical approach. It involves questioning one's teaching methods and applying theory to practice (Navaneedhan, 2011). Educators should apply reflective teaching pedagogy in classrooms to observe and reflect on results, allowing the classroom to become a laboratory for teaching theory. This innovative teaching-learning pedagogy sustains interest among teacher trainees, who are trained to adopt this methodology during their teaching practice.

Ryan and Ryan, (2013) propose a new model for teaching and assessing reflective learning, emphasizing the multi-dimensional nature of higher education and the need for strategic pedagogic intervention. However, deep approaches to learning, including reflection, are associated with a deeper understanding of educational material, they may not always lead to higher academic achievement due to assessment methods that don't reward deep learning (McLoone & Oluwadun, 2014).

Finally, Nur, Iman, Naseem, and Safdar, (2024) explores students' perspectives on reflective learning in higher education, using a qualitative and phenomenological approach. In-depth interviews were conducted with undergraduate and graduate students. The findings reveal that students support promoting reflective learning as it improves academic performance. Key elements of reflective learning include self-awareness, regular feedback, clear objectives, proper guidelines, and active engagement. The study underscores the importance of incorporating reflective learning into teaching practices.

The literature review on pedagogical approaches in education underscores the need to investigate the implementation of educational strategies for the Principles of Economics (ECO120) utilizing Analytic Hierarchy Process (AHP) analysis in higher education.

METHODOLOGY

This paper used Analytical Hierarchy Process (AHP) as a multi criteria decision-making method (MCDM). AHP is one of the Multi Criteria decision-making methods described by Saaty, (2012) to derive ratio scales from paired comparisons. In making judgments about the priority of the criteria, there are three steps in AHP that the researcher must follows (Brunelli, 2015). In step 1, the respondents are asked to perform pair-wise comparisons among the criteria. The scale is from 1 to 9, and its definition is described as in Table 1.

Table 1: Saaty's pairwise comparison scale

| Intensity of Importance | Definition |
|-------------------------|--|
| 1 | Equal importance |
| 2 | Weak |
| 3 | Moderate importance |
| 4 | Moderate plus |
| 5 | Strong importance |
| 6 | Strong plus |
| 7 | Very strong or demonstrated importance |
| 8 | Very, very strong |
| 9 | Extreme importance |

Source: Saaty, (2012).

If there are m criteria to be evaluated, then the respondent must make $m(m-2)/2$ comparisons. For example, 10 pairs of criteria will be compared if the number of criteria is 5. Suppose criterion 1 is compared with

criterion 2. If criterion 1 is ‘strong importance’ compared to criterion 2, then $m_{12} = 5$, and $m_{21} = 1/5$. All the pair-wise comparisons collected from each respondent were transferred into matrix form, M , where $m_{jk} = 1/m_{kj}$, $k > j$ such as in Figure 1.

$$M = \begin{bmatrix} 1 & m_{12} & \dots & m_{1n} \\ m_{21} & 1 & \dots & m_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ m_{n1} & m_{n2} & \dots & 1 \end{bmatrix}$$

Fig. 1 Matrix M

Evidently, one of the major drawbacks of AHP is that the number of pair-wise comparisons increases exponentially as the number of criteria increases. In Step 2, the degree of consistency is then measured by the Consistency Index (CI). Perfect consistency implies a value of zero, but as individuals’ judgments are often inconsistent, it is difficult to comply. Therefore, inconsistency up to a certain degree is acceptable in computing pair-wise judgements. The CI for M is calculated as

$$CI = \frac{\lambda_{max} - n}{n - 1} \tag{1}$$

where λ_{max} is the maximum Eigen vector of matrix M . If the consistency ratio, $CR = CI/RI < 0.10$, then the degree of consistency is acceptable, where the random index, RI values are given in Table 2 (Taylor III, 2004).

Table 2: Random Index, RI, Values

| Number of criteria, (n) | Random index (RI) |
|-------------------------|-------------------|
| 2 | 0.00 |
| 3 | 0.58 |
| 4 | 0.90 |
| 5 | 1.12 |
| 6 | 1.24 |
| 7 | 1.32 |
| 8 | 1.41 |

Source: Saaty, (2012).

In the third step, the weight for criterion $j, j = 1, 2, \dots, n$, for each respondent’s evaluation is calculated by using the following formula:

$$w_j = \frac{1}{n} \sum_{k=1}^n \frac{m_{jk}}{\sum_{i=1}^n m_{ik}} \tag{2}$$

This process is repeated for every criterion considered. Next, the rule for aggregation of judgments in a comparison matrix is to combine the judgments using the geometric mean if a study involves more than one respondent. Ranking of the criteria can then be determined with the weight values. The higher the weight of a criterion the higher its ranking when compared with other criteria. (Saaty & Peniwati, 2007; Saaty & Alexander, 2013). If p respondents were involved in the assessment, the final weight for criteria j is obtained as a geometric mean, that is, by taking the p th root of the product of all p weights of that criterion, as follows:

$$w_j = \sqrt[p]{w_{j(1)} \times \dots \times w_{j(p)}} \tag{3}$$

This study intends to use purposive sampling targeted at students that took ECO120 in UiTM Perak Branch Tapah Campus for the first semester of 2024. The study will sample 56 students. The questionnaires were created through Google Form and distributed online. All the respondents were explained on how to answer the pairwise comparison questionnaire for each criterion involve in this study.

There are five main criteria that were identified, which are constructivist, collaborative, inquire-based, integrative and reflective. The AHP framework were then developed based on literature review that has been discussed are shown in Figure 2.

After the criteria had been identified, each respondent will be asked to compare the importance of each criterion to another criterion, and the evaluation will be transformed in a matrix as in Figure 1. Then the weights of the criteria will be calculated by using equation (1). All judgments will be aggregated by using the geometric mean approach as in equation (3).

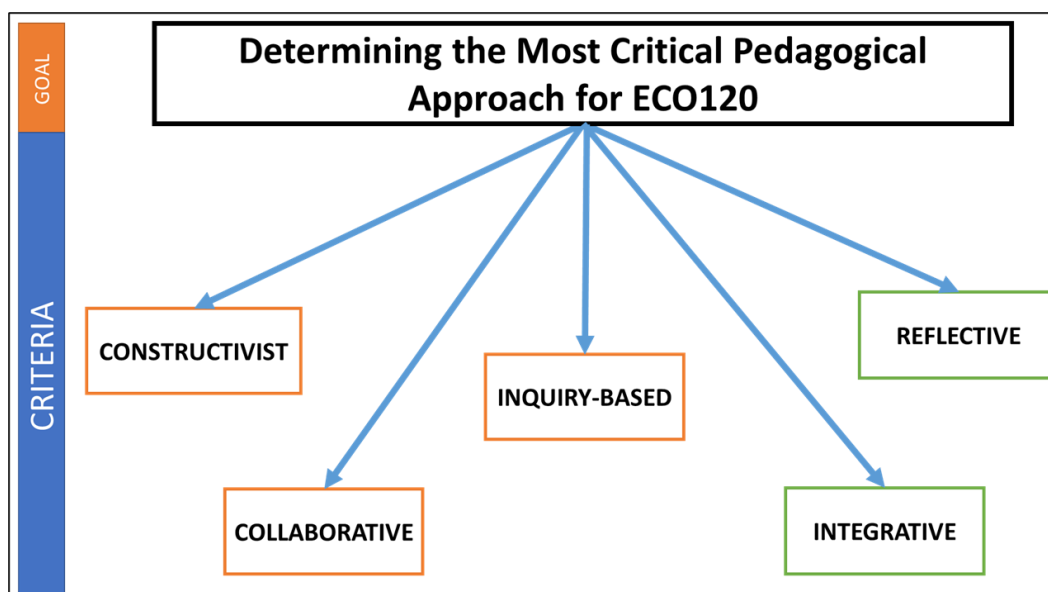


Fig. 2 AHP Framework

FINDINGS

Table 3 shows the most critical pedagogical approach considered by students for learning ECO120, where the main criteria groups are compared regarding their importance with respect to learning ECO120. The CR value obtained was 0.02, and the results were thus accepted.

Table 3: Priorities and ranks of the main criteria with respect of students in choosing DGBL tools

| | Priorities | Rank |
|----------------|------------|------|
| Constructivist | 0.23220 | 2 |
| Collaborative | 0.25939 | 1 |
| Inquire-based | 0.18923 | 3 |
| Integrative | 0.17655 | 4 |
| Reflective | 0.14264 | 5 |

Consistency Ratio (C.R.): 0.02740

Based on the AHP analysis it was found that collaborative approach had a higher priority yield at 25.9 per cent, higher than constructivist which yielded at 23.3 per cent. Both collaborative and constructivist approaches ranked at number one and two respectively.

The other three approaches all yielded a priority value below 20 per cent, with inquiry-based approach at 18.9 per cent, integrative approach at 17.6 per cent and reflective approach at 14.2 per cent.

These findings are in line with the previous literature where collaborative and constructivist are regarded as the most important factor to use in a classroom. For collaborative approach which ranked at number one, it is recognized as a significant pedagogical method in various fields of study. Scott and Ghosh, (2016) illustrate its efficacy in construction education, emphasizing enhanced student performance and favorable feedback. The previous literature that also discussed the importance of collaborative approach are Sunitha et al., (2024), Jacobs, (2010) and Hagaman, (1990).

Furthermore, constructivism which ranked at number two emerges as a significant pedagogical approach in the previous literature, highlighting the importance of active learning and the construction of knowledge by students. This method promotes critical analysis, participatory education, and the development of problem-solving abilities (Wulf, 2005; Sharma, 2014; Alanazi, 2016; Dagar & Yadav, 2016; Evtimov & Petrović, 2021).

CONCLUSIONS

The findings indicate that the collaborative approach is the most essential teaching method for students enrolled in ECO120. This indicates that collaborative learning, where students interact with their peers, markedly improves comprehension and recall of economic topics. The constructivist approach, which prioritizes students' active creation of knowledge via experience and reflection, is seen as the second most significant. This underscores the importance of enabling students to construct their own comprehension through experiential learning activities. The inquiry-based approach is ranked third, suggesting that although promoting student inquiry and exploration of economic concepts is advantageous, it may be less effective than collaborative and constructivist methods. The integrative technique ranks fourth, indicating that the incorporation of interdisciplinary perspectives into economic studies, while beneficial, is of somewhat smaller significance relative to other methodologies. The reflective technique, in which students actively contemplate their learning process, is ranked fifth, indicating that although reflection is advantageous, it may not exert as significant an impact on learning outcomes as the other methodologies.

RECOMMENDATIONS

Based on these findings, instructors teaching ECO120 should emphasize a collaborative approach in their teaching methodology. Group projects, peer conversations, and collaborative problem-solving activities should be consistently integrated into the curriculum. The constructivist approach should be underscored by creating learning experiences that enable students to investigate and develop their comprehension of essential concepts, including case studies and simulations. Inquiry-based activities, such as research projects and critical thinking exercises, should be included to foster curiosity, however balanced with collaborative efforts. Integrative activities, such as incorporating perspectives from other disciplines (e.g., history or politics) to enhance comprehension, can supplement the basic pedagogy but do not have to be the primary emphasis. Ultimately, while reflective practices hold significant value, they ought to serve as a supplementary learning tool, such as through end-of-week reflections or journals, rather than being the primary instructional technique. By aligning pedagogical practices with these findings, educators can enhance student engagement and comprehension in ECO120.

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