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Student ambition and national needs: an evidence-based student allocation model

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ABSTRACT

Student choice in university majors is largely influenced by their preference and not the demand in the labor market. This is indicative of poor alignment of Ministries of Higher Education, Education and Planning that creates surplus supply of graduates in traditional areas and deficit in priority areas. This imbalance leads to unemployment and shortage of skills in the labor market. This paper constructs a student allocation model based on evidence that meets labor market forecasting and national development objectives. The research is an integrated multimodal student allocation model based on labor market expectation, institutional capacity and governance mechanisms and industry feedback in the post-conflict countries such as Iraq. Herein lies the uniqueness and novelty of this study. The research was based on a quantitative cross-sectional design, which involved 153 stakeholders, such as policymakers, administrators, planners, and industry experts in Iraq. Results showed that the impacts of all the predictors were statistically significant, with economic forecasting and career guidance having the largest impacts on the effectiveness of the strategic student allocation system. The outcomes are used to support the evidence-based student allocation system to meet the needs of national workforce in Iraq at the output of higher education. The model provides practical policy recommendations to stakeholders on gradient mismatch and on the way the country's higher education system can be better aligned with the needs of the labor market.

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1. INTRODUCTION

The alignment of higher education (HE) outputs with labor market demands is a very important policy issue in the post-conflict developing nations. Post-conflict reconstruction in Iraq has exacerbated the necessity to make university education outputs responsive to national development needs. Even though there has been an increase in enrolment, Iraq does not have an organized system to match student specialization options with the long-term national labor market requirements.

The HE system in Iraq is a broad net of institutions, established by hundreds of public and proprietary universities, colleges and institutes of technical preparation, serving hundreds of thousands of students in many areas of knowledge, on a study and vocational level. Such massive infrastructure indicates the commitment to education that Iraq has paid significant attention to since most of them are young, comprising 60% of Iraqis [1]. Nevertheless, learning difficulties still exist, especially in primary and secondary education, which have a low completion rate, especially amongst the low-income groups [2].

The literacy levels have risen during the years, but they remain lower than the ambitious level, among certain countries in the region, where it is estimated at 85-88% literacy level on average [3]. This has consequences on the preparedness and quality of students who join institutions of higher learning because of these challenges in the previous stages. The history of development of the HE system in Iraq indicates that structural gaps are still present and they affect the present-day choice of student programs. Prior to the 1980s, there was a relatively well-developed HE system in Iraq. However, a conflict, decades of sanctions and political unrest had undermined the strength of institutions and the institutional coordination between the education planning and the national development plans. While there is a remarkable increase in the number of students being enrolled in universities since 2003, the connection between universities production and the requirements of the labor market was not reflect in the university degree program to a high level. Otherwise, the gap between the impulse of students to study some disciplines and the country's economic and future need to develop other disciplines will widen. Bridging this gap will reduce unemployment levels among university graduates and raise the level of relevant development in the country due to the provision of human capital in the key sectors that the country needs now and in the near future.

Recent trends in enrolment in Iraq suggest there is an apparent imbalance between student preferences and the needs of the national labor market. The Iraqi Ministry of Higher Education recently reported that more than 60% of university students are enrolled in majors in medicine, dentistry, engineering, pharmacy and law- all majors typically symbolizing a high level of social prestige and economic security. The number of medical colleges taken on their own accounts only would result in all the medical colleges having about 25% of the entire university making it up and yet the healthcare system in the country is in a position to absorb only a small percentage of the graduates. In the meantime, the disciplines of agriculture, education, environmental sciences, information technology, renewable energy, and vocational technical education are facing challenges of adequate enrolment leading to severe deficits in disciplines necessary in the diversification of economy and sustainable development of Iraq [4].

Such trends in student preference mirror highly ingrained cultural-social scenarios that value some occupations over others and de-value others that are vital towards national development. Social prestige and perceived income are the key factors that impact student choices instead of evidence on the labor market or national needs in development. This issue is worsened by the lack of comprehensive systems of career guidance, leaving students and their families to make some very serious educational choices by using very little evidence and their social perceptions to estimate rather than evidence-based analysis on labor trends in the market and economic situations.

This mismatch is a contribution to graduate unemployment and restricting the diversification of the Iraq economy. Iraq is still over-reliant on oil, with more than 90% of government revenues and exports being oil. Human capital investments in the non-oil sector in areas of agriculture, manufacturing, tourism, information technology, renewable energy and services are needed to support economic diversification drives. Nonetheless, this trend of HE outputs currently does not offer the skilled labor force required in such diversification efforts to end the reliance of the economy on oil resources and increase the chances of a sustainable growth of the economy.

Funding close to 50% on capacity building and training on solar energy and green skills is also indicative of observed opportunities in renewable sectors as Iraq has been recognized by the international community. Nonetheless, there are not enough graduates with the pertinent technical and scientific backgrounds to serve these emerging industries as the existing system in HE continues to yield inadequate results. Equally, Iraq has huge agricultural opportunities, water, and geographical position that all hold great economic potential that is still not fully exploited due to human capitals limitation in corresponding areas of technical and professional skills.

The process of development of HE in Iraq has passed many ages, the universities in the last few decades have developed, but no mechanism has been organized to match the universities students and courses with the needs of the labor market and the national development. So far, this research pertaining to education – labor market alignment has largely focused on analyzing individual modules (career guidance, labor market outlook or institutional planning), and has not been able to link them together into a concept of allocating individual actors in such a framework, or groups of actors, primarily assuming peace conditions. Therefore, an empirically tested multi-dimensional model that covers both economic forecasting as well as provision of governance mechanisms, institutional capacity, industry collaboration and the support systems for students that will be allotted to specific sectors in one holistic strategic model has yet to be addressed.

With this in mind, in the current study an integrated evidence based type of student allocation model for the HE institutions in Iraq will be developed and empirically validated. The study is a valuable contribution to the literature, as it offers a 'full circle' solution, which takes account of both the planning of universities and the intelligence of the labor market, but also the priorities faced by national development, in particular for a post-conflict state. Few studies have been comprehensive in addressing an integrated student

allocation system in the literature on the relationship between HE and labor market demand, and most of those are mechanistic, that is focused on addressing one aspect of the HE - labor market demand relationship. In addition, evidence is scarce from post-conflict settings and there is a lack of multi-stakeholder allocation processes. This research tries to fill these gaps and involves elaboration and testing an integrated student allocation model in Iraq which integrates labor market forecasting, governance, institution's capacity, industry cooperation and match to the national development process in one single model.

2. LITERATURE REVIEW

2.1. Economic sector and market forecasting

The correlation between economic forecasts and the effectiveness of educational planning has come up as being central to research in human capital development. There is a rich literature that explains why advanced analysis of the labor market is imperative in terms of resource distribution within a higher education sector. The theoretical basis of this relationship relies on human capital theory first formulated by Becker [5] and further contributed by various authors who put an emphasis on the necessity to adjust the investments in education in terms of the economic returns and needs of the society.

Psacharopoulos and Patrinos [6] developed an extensive meta-analysis of 1,120 studies that compare returns on education in 139 countries and concluded that educational investments perform better when educational outputs are in line with labor demand. This analysis has shown that the returns on educational investments have been 23% higher in countries that had their labor market forecasting systems in comparison to those countries which did not have their systems in place. Graf and Lohse [7] further developed this analysis to look at long term growth patterns and proved that countries that had strategic human capital planning were faster by 0.8% annually in their gross domestic product (GDP) growth rates in 50-year periods. Such results support the economic advantage of evidence-based student allocation systems with a good sense of empirical evidence.

Recent developments in technology have also changed how labor market prediction can be performed with the use of artificial intelligence and big data analytics bearing new opportunities to increase the accuracy of prediction and/or decrease the complexity of analysis. Bright and Pryor [8] studied applications of machine learning in workforce planning, showing that accuracy in forecasting is 35% higher when the real-time data on employment and social media popularity and economic indicators are included in the AI-enabled systems. Other studies [9], [10] examined the effects of technological evolution on the structure of employment on the percentages of the populations and demographics in various sectors and occupations by analyzing the extent to which technological change has been having an effect on the skill demands on human capital planning.

The dimension of economic forecasting concerned as sectoral analysis poses unique challenges to the developing countries that are faced to strike a balance between traditional economics and newer industry and the integration into the global economy. According to Baldwin [11], globalization influences the demand patterns of labor, and the countries that have successfully undertaken the process of drawing into global value chains need extensive knowledge related to international skills requirements and technological transfers. In response to this view, Rodrik [12] presented counterevidence suggesting that the overemphasis on globalization can undermine national economic development matters and that balanced policies need to be devised to incorporate international competitiveness with local economic interests as well.

The developments in regional studies on economic development of the Middle East countries can also offer much needed information on the particular challenges in the context of Iraq and other countries within the region. In the article by Assaad and Krafft [13], labor market dynamics in Arab countries were examined, and it was revealed that the economies with oil dependency experience special difficulties in diversifying the development of human capital linked to resource curse impacts and the weak development of the private sector. El-Kogali and Krafft [14] discusses the failure to provide high skills or economic returns through decades of education investment in MENA and pinpoints four contradictions in society that trap it, including credentials versus skills, discipline versus inquiry, control versus autonomy as well as tradition versus modernity. It indicates that the new paradigm is push, pull, pact: push early and inclusive learning of quality, pull skills as needed in labor markets, and establish a national pact among all stakeholders.

Temporal aspects of forecasting continue to pose a challenge to educational planners who have to reconcile between short term demands of affording employment and long-term goals of transforming the economy. Jo *et al.* [15] derives a stock-flow model in the system dynamics (SD) to predict the unemployment and employment rates in South Korea based on the GDP growth, inflation, and job vacancies as the prime inputs. The model is representative of the 1990-2020 trends as well as the forecast of developments in 2021-2030. The simulation of policies indicates that raising the reemployment and decreasing the amount of voluntary unemployment is more effective than finding new jobs. The results have given an idea to formulate specific employment policies. Radcliffe [16] discuss how the abundant availability of the labor force may

force wages to fall, particularly in the low-competence businesses with low barriers to participation. The education and specialization industries have higher pay rates since there is a shortage of labor and provision of training. With this, education and training are important in the realization of the economy and wage inequality.

Frey and Osborne [17] analyzed the likelihood of computerization of 702 occupations, stating that education systems should focus on cognitive and social skills that do not compete with the technological skills. The importance of workforce skills and human capital planning as a critical factor that leads to economic growth and social development in the course of a comparative international research study is recommended. As stated in the Rodrik [12], the nations, which invest in educational growth, training, and social protection, are in a better position to embrace the best of digital changes to reduce inequality and labor market disruptions. Likewise, World Bank [18] notes that the success of human capital strategies in developing countries necessitates a long-term political commitment, high institution capacity, as well as monitoring and adaptation to keep the outcomes sustainable in the long-term in economic and social spheres. Polices involving the matching of education, labor, and technology systems are thus necessary to allow maximizing the returns of the human capital development. These results indicate that education-workforce alignment is enhanced by labor market predictions. This kind of integration is not only effective in coordinating the harmonization of educational output and the needs in the labor market but also contributes to sustainable economic growth. Thus, the hypothesis was formulated as: analysis of the economic sector and forecast in the labor market plays a positive role in the effectiveness of the strategic system of student allocation in Iraqi universities (H_1).

2.2. Student guidance for stable future careers

The career guidance systems are critical to the development and educational decisions, career outcomes, and decades of research has provided evidence of the necessity of a systematic counselling process of matching personal proficiencies, interests, and labor market opportunities [8], [19]. With the emergent theories of modern career development like chaos theory of careers and career construction theory, adaptability, narrative identity and life themes have been stressed in the vocational decision making [8], [20]. Likewise, cognitive information processing approach emphasizes that the effectiveness of decision-making is affected by knowledge and the strategies employed to make a vocational choice [21].

Career guidance programs in which the education takes place in a systematic manner have been found to enhance employment, job satisfaction and persistence in education. Meta-analytic findings show that students with a guided structure have a higher probability of choosing one education program and pays attention to labor market requirements as well as the probability of completion of the educational program [22], [23]. Career counselling that is well established early also is long-term beneficial, as it helps in positive career progression and elevated life satisfaction over decades [3].

There are some challenges of implementation of effective career guidance in developing countries such as resources, institutional capacity as well as cultural factors [24]. New studies indicate that cultural orientation, such as collectivist and individualist norms, has a massive impact on the process of career decision-making and accommodating culturally responsive guidance practices [25]. Furthermore, it has become critical to apply live labor markets intelligence to counselling, such as a recent study showing that increasing the accessibility of non-traditional credential data (e.g. MOOCs) is highly correlated with improving job attainment by workers in developing countries [26].

The use of technology has reshaped the service provision of career guidance in terms of its availability and uniformity due to the use of electronic mediums as well as introducing new issues of service provision quality and equity [3]. It has been indicated that a combination of traditional counselling with technology-based services yields the optimal results in low- and high-resource settings [27]. When interventions happen and how long they last also count because, continuous support throughout early secondary school to post-secondary transitions has proven more effective when compared to occasional sessions [23].

The role of professional development in career counsellors has a significant impact on the success of a program, and the most apparent competencies in this area deal with mastering assessment techniques, labor market analysis, cultural sensitivity, and communication skills [28]. The quality of the career guidance program and its overall efficacy must be evaluated with regards to many outcomes so as to ensure that the program is constantly improving, which is satisfaction, decision confidence, academic persistence, and employment outcomes [29]. Taken together, these findings highlight the multifaceted nature of career guidance systems and their critical role in improving student outcomes and labor market alignment. According to the literature and the Iraqi context, career guidance and student counselling are anticipated to enhance student performance and match educational routes with personal and national priorities; hence, the

hypothesis was suggested as: career guidance and student counselling systems have positive effects on strategic student allocation system in effectiveness of universities in Iraq (H_2).

2.3. Government stimulus programs

Government policies aimed at strategic allocation of students designed and implemented are vital, especially in the context of how policies emerge as a result of learning. Studies indicate that effective implementation must entail official regulations and also adaptations to new challenges, which occur during the implementation process [30]. Behavioral economics also argues that the right structures of choice and nudges could be used to guide student decisions to socio-economically relevant decisions [31]. All these findings assess the fact that successful student allocation policies are a synthesis of adaptive governance and behavior-informed interventions.

Recent theories look at the role of government in HE and emphasize economic reasons like market failures, lack of information of peers and externalities as reasons to involve government in rational strategic allocation of students. This is seen to be the case with purely market-based measures or systems, which leads to suboptimal results in foods or housing in societies, particularly in the developing world. Scholarships, loans and incentives targeted at attainment of national priorities will help harmonize student decisions, but without jeopardizing equity and access [32], [33].

The performance of diverse incentive schemes in education has been widely studied not only on the theoretical level of modelling but on empirical testing of different policy applications in a variety of cases. Implementation of conditional cash transfer scheme has shown to have an impression on educational decisions when they are well tuned to the local economical situations and combined with supportive interventions to further improve the learning outcomes [34]. Financial incentives may be accompanied by such behavioral interventions as recognition, social approval, and career development opportunities, all of which influence the student choices of action with less fiscal effort spent, thus highlighting the role of non-monetary motivation in the education setting [35].

Research on developing countries is very informative on the issues of the government interventions in the allocation of students in various regions. Effective and efficient student allocation systems should have a close balance between central planning and choice, and it should only inform and incentivize but not specify a path of education [36]. Student allocation decisions are likely to be affected by government incentives and information systems [37]. Information provision is a very important element in the government policy. By presenting quality information on career opportunities, earning potentials and program quality would help students immensely to make their decisions without cramping personal rights. Information campaigns are only effective when they involve long-term communication, reliable information channels, and messages that are customed to the different student groups [38], [39].

The implementation problem in developing countries is still extensive. The efficient systems of student allocation presuppose long-term investments in the administrative capacities and monitoring systems and constant improvement processes [40]. Policy effectiveness is still an important issue that should be measured and assessed. The use of randomized controlled trial and systematic administrative data collection can serve to upgrade policy on the basis of evidence as well as consider methodological shortcomings in the complex contexts [41]. The concept of sustainability and political economy is the key to effective design policy which regulates the allocation of students. Long-term successful systems must incorporate wide stakeholder-engagement regarding the process, institutional safeguards against political distortions, and adaptive processes that accommodate changing economic and policymaking in the country [42].

Recent research specifies the importance of behavioral insights when making decisions in education. Interventions based on choice architecture such as decision framing, timing manipulation, and nudges have been revealed to have positive effects on student preferences and bear minimum financial cost [43], [44]. These so-called nudges in behavior supplement simple traditional incentives as they aid in correcting cognitive bias in favor of more informed and prescient decision making. All these findings emphasize the necessity of government policies and incentive structures in Iraq to steer student decision-making, make educational trajectories nationally oriented, and improve the performance of strategic student placement systems. Thus, the hypothesis was formulated as: there is a positive impact of having government stimulus programs on strategic student allocation system effectiveness as perceived by the Iraqi universities (H_3).

2.4. Planning for university capacity and resource management

The capacity and allocation of resources in universities have become more strategic and sensitive to the situation. According to Ferrero and Salles-Filho [45], flexible budgeting models are necessary to support different goals of academic units since the traditional budgeting does not consider peculiarities of the academic unit goals. Renick *et al.* [46] insist on making considerations on the impact to the society and also the communities since an internally oriented allocation may not represent what is of more urgency. In combination, these papers show the tension between the standardized approach presented in earlier

chapters and individuated, context insensitive strategies. One of the areas that have differing opinions is faculty development. According to research by Salajegheh *et al.* [47], institutional context and individual needs are equally important to the success of any program, which is why standardized training models are problematic. This follows the notion by Ferrero and Salles-Filho [45] who believe that resource allocation needs to be associated with specific human-capital building plans.

An increased use of technology without training makes university resource planning more complicated. Although the technological preparedness placed by Wang *et al.* [48] is a critical factor to the digital change, critics note that it should consider institutional context and strategic alignment. As highlighted in these concerns, the development of effective planning implies taking into consideration issues of technology, pedagogy as well as organizational issues and not only on structure investment.

There is the growing need in quality assurance and adaptive planning. Biloshchytskyi *et al.* [49] promote project-driven, flexible strategies of monitoring rather than a static one, as well as Lin and Lee [4] who focus on adaptive capacity planning and learning within the organization. Collectively, they trouble traditional presuppositions of linear, planification in university planning.

Last, allocation of resources becomes complicated due to regional and international coordination. Knight [50] stresses that regional cooperation must be planned well and the goals should be aligned since one should not presume that cross-regional collaboration will always lead to efficiency and capacity advancement. Renick *et al.* [46] suggests much the same by emphasizing the role of context-specific approaches, demonstrating that holistic results rely on contextually prioritizing the main needs of local institutions, with considerations to external collaboration goals.

Such observations indicate the importance of HE capacity planning and allocation of resources in Iraq as such issues can help institutions achieve better efficiency and the overall plumbing process of students in programs and entail improved educational quality. Thus, the hypothesis is as: university capacity planning and resource allocation has a positive and significant impact with respect to effectiveness of strategic student allocation systems Iraqi universities (H_4).

2.5. Effective collaboration between industry and academia

HE planning has been strongly recommended as the approach of integrating industry views in the planning process that is critical in driving relevance in education and job placement in the employment market. However, the outcomes of more recent studies show that these kinds of collaborations do not always prove fruitful, and their success, in various situations, may vary drastically. In knowledge based economic growth and development, even though triplet helix models and stakeholder theory stress the correlativity of university-industry-government relationships, it is controversial where different institutions apply such concepts. Indicatively, a model, proposed by Yang [51], presents a multi-perspective mode of university-industry collaborative innovation, and its presentation testifies to the complexity of value creation through such collaborations. That complexity empowers the presumption that the transfer of identical models to improve the results of education everywhere is not always applicable.

Successful university industry partnership is frequently represented as needing institutionalized methods of relationship development and management. Empirical evidence, however, shows that such partnerships often end up facing institutional barriers such as culture misalignment, institutional misalignment, and even communication barriers. Rossoni *et al.* [52] in their systematic review define these as some of the major considerations that impede successful research, development, and innovation partnerships. Such results undermine the usefulness of prescriptive approaches which are not sensitive to the context.

Another contested issue relates to the industry feedback in the creation of the curriculum and the design of programs. Although incorporating employers is often assumed to enhance educational relevance, new studies show that incorporating is a complex phenomenon. An article by Dang *et al.* [53] examines the performance and efficacy of knowledge exchange mechanisms through the lens of various stakeholders, demonstrating that the perceptions of the same are rather different and that finding common grounds between industry requirements and academic interests is not an easy task.

The major concern of relationships between universities and industries is technology transfer and innovation collaboration. The effective work of technology transfer programs also does not lie only in the committed resources and systematic involvement. Research conducted by Abu Sa'a [1] focuses on firms that have little experience in collaboration and how an adequate level of guidance is necessary to make the process go smoothly. This explains why industry partners should be considered as far as the capabilities and the readiness of the partners are concerned.

University-industry collaboration can be characterized by its own challenges and opportunities with small medium enterprises (SMEs). Although SMEs usually do not have formal resources to enter into partnerships, they can provide valuable knowledge of the local market conditions and what skills are in demand. Schneider [54] provides research on the position of intermediaries in facilitating university-industry

research partnership, in which some structural support is required to assist in filling the gap between the universities and SME.

Effectiveness of collaboration has been evaluated by broad frameworks that gauge the knowledge transfer, innovation results, employment of students as well as the economic impact of the region. It is however unclear whether these frameworks can be applied in various settings. According to a study by Vuoriainen *et al.* [55], there are six essential aspects that are required to make the collaboration between HE providers and industry successful, with alignment to the requirements due to the rapid change of technology and the levels of professional certificate being two critical elements. It implies that the universal models of evaluation might not be sufficient to cover the specifics of different collaboration situations.

Industry organizations and professional associations can be considered as a middle-ground in the educational planning, offering standards of competencies, certification program, and career pathways to be revealed. The usefulness of these organizations in helping structured interactions and feedback between employers and universities is, however, not unanimously recognized. One of these studies was done by Shi and Wang [56] and seeks to provide more information on the aspect of entrepreneurship in universities through the understanding of the dynamism of proximity in university-industry-collaboration. This shows the importance of having a balanced insight into the roles and effects of intermediaries in the cooperative work.

There is also international cooperation towards building graduate employability and competitiveness. Global industry alliances offer access to superior technologies, external markets, and a wide range of expertise but there are risks that have to be managed, which include managing cultural differences and intellectual property issues. In a study conducted by Zhang and Liu [57], they mentioned the inoperancy of industry feedback in the quality assurance measures, the betterment of institutional responsibility and program enhancement. However, challenges that pertain to the management of international collaborations can make the realization of these benefits complex. The effectiveness of student allocation is predicted to be enhanced by industry-academia collaboration. The differences in the prospects of the Iraqi situation demonstrate the necessity to reassess critically the premises of the existing models and frameworks. Thus, the hypothesis as: collaboration of industry and academia and feedback, positively and significantly impact strategic student allocation system effectiveness in the Iraqi universities (H_5).

2.6. Aligning student allocation with national development priorities

The current national visions are increasingly advancing the idea that universities should be in line with plans on work force and within a given development. However, subsequent policy currents attempting to run skills-first agendas tend to over-promise and under-deliver. Indications reveal that when aligned extensive, the curriculum may get narrowed, disciplinary variety decreased, and universities subjected to political transformations instead of building settled strengths [17], [58].

Critics of alignment believe that there will be increased productivity by matching the degrees with the predicted jobs. Nonetheless, incessant skills mismatches show the boundaries of such reasoning. Even in the countries with well-developed data systems, overqualification and underqualification remain prevalent, demonstrating that the maldistribution of labor will not be solved by the alignment efforts, alone [59], [60].

Such a solution to governance problems as the provision of national strategies on HE seldom suggests to bring about the advertised flexibility. The revisions of blueprints tend to work quicker than universities redesign programs and create compliance cycles instead of significant innovation. The most apparent results are usually reporting overheads and the churn of priorities in the short term instead of greater responsiveness on the side of the system [60].

Specific investing with priority receives a more appealing paper record than in the actual implementation. Such focus on resources may be a barrier to foundational capacity-building such as wide STEM pipelines, academic advising, and student support, research infrastructure. Employers frequently report deficiencies of teamwork, problem, and technical skills where it is shown that the route of the narrow targeting does not lead to improve the labor outcomes [60].

There are also barriers to the concept of international policy transfer. The belief that what is working elsewhere can be scaled down on a local head does not put into consideration administrative and cultural transaction costs. Policy convergence can trap the universities into pre-packaged designs of international norms ill-fitting local peculiarities [1], [7].

Surveillance mechanisms have been extended to even multidimensional measures of prosperity and improvement. Although, these frameworks are supposed to enhance policy, in most cases, institutional judgment is supplanted promoting the maximization of metrics as opposed to the prioritization of educational quality. The use of dashboards overcomes decision-making cycles and makes pedagogical becomes secondary to paperwork [61], [62].

Regional integration is always encouraged on the basis of the economies-of-scale. However, this may be weakened by coordination overheads, instances of uneven institutional capacity, and complexity of administration. A variety of universities find themselves with slower decision-making, and less possibility of

local experimentation instead of the promoted streamlined specialization [7]. Thus, the hypothesis is: the degree of alignment of the national development priorities increases the strategic student allocation system effectiveness in the Iraqi universities (H_6).

This study is rooted on ideas that had originated from various theories, however, the primary theory in this study is the human capital theory. This theory's focus is the important role of educational systems in economic and social development, provided that human capital is enhanced to a certain level aligned to the requirements of the labor market. It suggested a strategic management solution using complementary processes of labor market forecasting, career guidance, governance mechanisms, placement of universities, reactions of industry and adjustment of national development priorities for strategic allocation of students and the contribution to the national workforce along these strategic processes.

2.7. The proposed conceptual framework

According to the literature review and situational analysis of HE in Iraq, the selected conceptual framework, as seen in Figure 1, illustrates how several strategic variables relate to each other and the efficacy of a student allocation system in a nation. In that context, six independent variables, that is, economic sector analysis and labor market forecasting, career counselling and student guidance system, government policy and incentive mechanisms, capability planning and resource allocation in universities, industry-academia collaboration and feedback systems, and alignment of the national development priorities, are defined as the main contributor that affects the effectiveness of students allocation system as the dependent variable.

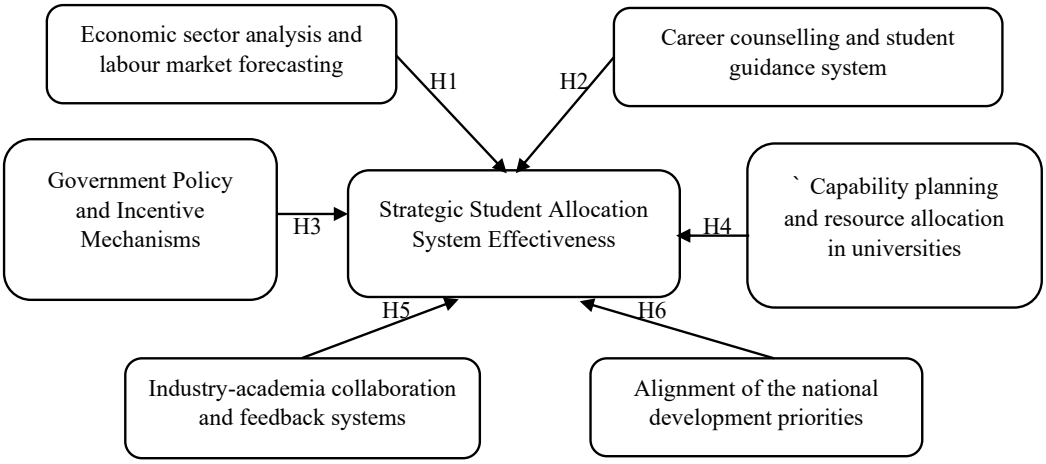


Figure 1. Conceptual framework

3. METHOD

3.1. Research design

In this research, a quantitative cross-sectional research design was utilized to test the relationships between six independent variables and the effectiveness of strategic student allocation system in Iraqi universities. A cross-sectional design was appropriate for capturing stakeholder perceptions at a single point in time of the varied system of HE in Iraq besides the statistical analysis of the hypothetical relationships to satisfy necessary time and resource limits. The stakeholder perception was captured at one point in time, which was a cross-sectional design, but it cannot be used to draw causal conclusions.

The relative impact of independent variables on the dependent variable was evaluated by means of multiple regression analysis. The method is well adapted in cases where the study aims at identifying the predictive value of various policy and institutional variables to the success of a strategic system. This method determines the strongest predictors in the suggested model.

3.2. Population and sample

The target population was the policymakers, administrators of university, economic planners and industry representatives in Iraq who were involved in HE decision making. The purposive sampling was applied to select participants in accordance with roles and expertise. The total number of questionnaires sent out was 200 and 173 were received. Following the elimination of incomplete questionnaires, 153 valid questionnaires were analyzed.

3.3. Data collection instrument

The data were gathered with the help of a structured questionnaire, which was created to measure six independent variables and one dependent variable. Table 1 shows the operation definitions of the variables. A Likert scale of five-point (1=strongly disagree to 5=strongly agree) was applied. Experts reviewed content validity and the reliability was measured using the Cronbach alpha [63].

Cronbach's alpha for the scale was 0.849 which is the criterion for good internal consistency. The value is above the recommended value of 0.70, which certifies that the instrument could be used for the further statistical analysis as instrument is reliable. To ensure the content validity, the experts in the area of HE policy and strategic management took over the review process of the text, and three experts gave positive comments.

The method of detecting common method bias, by conducting Harman's single factor test [64], was employed to test for the possibility of common method bias due to the self-report data of the questionnaires. The principal component analyses results indicated that the proportion of variance of the first factor was 57.05% and it was greater than the proportion of variance of the dividing line (50%). This suggests that common method variance may exist for these data. This is an exploratory test and results cannot be interpreted with blind faith, since method systemic errors have been shown to exist in this test. Some measures were taken to reduce bias in the data collection including keeping the respondents' identity anonymous and framing the questions well.

Table 1. Operational definitions of study variables

Var. Name/Var. Type (Independent/dependent)	Operational definition	Measurement indicators (examples)
Economic sector analysis & labor market forecasting/IV	The degree of institutional uptake and utilization of labor market information and economic forecasting on students' allocation.	Labor market reports available, labor market forecasts used, and programs aligned with demands of the labor market.
Career counselling & student guidance/IV	The impact of organized counselling streamlines on students' academic and career decisions.	Availability of counselling support; quality of career information availability; student awareness of job opportunities.
Government policy & incentive mechanisms/ IV	The influence of national policies, regulations and incentives on the allocation of students and choice of program.	Entry requirements, scholarship incentives, clarity of policies and enforcement.
Institutional capacity planning & resource allocation/IV	The capacity of universities to integrate enrollment with existing campus infrastructure, staff, and academic services.	Availability of staff; effectiveness of planning the use of classrooms/labs; efficiency of enrolment planning.
Industry–academia collaboration & feedback systems/IV	Level of interconnection among universities and industry in order to facilitate labor market relevance of academic courses.	Experiential learning programs, employer evaluations, and partnership-based curriculum development.
National development alignment/IV	Student allocation as per the priorities in the national economic and social development.	Consistency with national development strategies; admission into nationally prioritized fields; development-oriented policies.
Strategic student allocation system effectiveness/DV	The influence of the student allocation system in matching students to relevant programs to address national priorities and the demand for the labor market.	Enhanced skills–labor market alignment; strengthened graduates' employment prospects; and Streamlined allocation decision-making.

3.4. Data analysis

Microsoft Excel was used to analyze data, and multiple regression analysis was used to examine the correlations between the independent variables and the dependent one. Correlation analysis was performed and then multiple regression was carried out to determine the overall effects of independent variables. Multicollinearity was assessed by the values of variance inflation factor (VIF) and model assumptions were tested with the help of residual plots. To check the regression assumptions [65], normality, homoscedasticity and independence of residuals were tested; regplots and diagnostic tests indicated that these assumptions were reasonably met.

The assumptions of the model to be used in the multiple regression analysis were tested before the regression analysis. Normality was assessed visually by examining possible discrepancies in the distribution of the residuals and probability plots. Equal variance (homoscedasticity) was investigated with the scatterplots of the residuals. Residual analysis was used to determine independence of the errors and VIF values were used to determine the multicollinearity. Results for all of the diagnostics showed no serious violations of the regression assumptions and the data were deemed suitable for multiple regression analysis.

4. RESULTS

4.1. Correlation analysis and multicollinearity assessment

The results of the correlation are provided in Table 2, which shows a positive correlation among all variables. All variables had significant positive relationships and there were some relatively high intercorrelations that may alert one to potential issues of multicollinearity. The correlation matrix shows satisfactory degree of positive relationship between all variables, which means that the independent variables move in the same direction and there are concepts that have link each other. However, there are some relatively high correlations, which may signal potential overlap among constructs and may be worth examining to determine if multicollinearity of any of the variables needs to be examined for the regression analysis.

Table 2. Correlation analysis results

	EcoSec LabFor	CareCoun StudGuide	PolIn Gov	CapPlan ResAll Uni	IndAcad CollabFeed	NatDev Align	StratStud AllocSysEff
EcoSecLabFor	1						
CareCounStudGuide	0.657	1					
PolInGov	0.657	0.608	1				
CapPlanResAllUni	0.689	0.603	0.652	1			
IndAcadCollabFeed	0.659	0.647	0.619	0.6937	1		
NatDevAlign	0.616	0.615	0.630	0.6626	0.625	1	
StratStudAllocSysEff	0.866	0.809	0.812	0.8482	0.839	0.819	1

4.2. Multiple regression analysis results

The regression equation was significant, indicating high percentage of variance in the dependent variable (R^2=0.993; adjusted R^2=0.993). This exceptionally high value is, however, to be taken with caution as it may suggest possible overlap of predictors or common method bias. The general model showed significance, $F(6, 146)=3454.69$, $p<0.001$, which implies that the predictors are significant in explaining the dependent variable. All independent variables were significant ($p<0.001$). Economic sector analysis and labor market forecasting had the most significant impact among the predictors and then career guidance and student counselling, which showed their key position in enhancing the effectiveness of the allocation systems. The results of the multiple regression analysis are shown in Table 3. The extremely high proportion of variance (R^2=0.993) explained by the model might also suggest overlapping of constructs and method variance and therefore should be interpreted with care.

Table 3. Multiple regression analysis results

Variables	B	SE	Standardized coefficient (β)	t	p	Decision
EcoSecLabFor	1.6223	0.0698	0.257	23.238	6.55E-51 (<0.0001)	Supported
CareCounStudGuide	1.5805	0.0784	0.208	20.167	4.78E-44 (<0.0001)	Supported
PolInGov	1.0946	0.0723	0.181	15.141	9.95E-32 (<0.0001)	Supported
CapPlanResAllUni	1.2159	0.0767	0.190	15.861	1.44E-33 (<0.0001)	Supported
IndAcadCollabFeed	1.3677	0.0759	0.220	18.020	6.09E-39 (<0.0001)	Supported
NatDevAlign	1.2390	0.0700	0.207	17.706	3.56E-38 (<0.0001)	Supported

4.3. Regression analysis and model fit

The results of the regression R^2=0.993 are the determination coefficients which show that the proposed model can be successful and influential in the process of strategic allocation of students. Partly, the importance of this strength is to the integration of all the conceptually factors of the study; all predicting variables are interlinked with each other, in the form of characteristics of the system in terms of institutions and governance, labor market. As such, in system type models – particularly in the case of perceptual Likert data – it can lead to a spuriously elevated shared variance between the constructs. Furthermore, the relationships that are observed are not predictors; but rather are interacting policy and institutional conditions. This is not to say that the predictions are perfect, and that the results have been definitively determined, but it is important to read those results as arising from a theoretical model based on a strong correlation that produced those results.

5. DISCUSSION

5.1. Key findings

The findings show that the combination of economic sector analysis and labor market forecasting can provide a better match of the HE output and the changing needs of the labor market. In this context, the findings highlight the importance of enhancing labor market forecasts to optimize student placement, particularly as required skills evolve. This implies that the efficiency of human capital development in the Iraqi universities is enhanced by alignment of student placements with labor market demand. The outcome underscores the relevance of labor market information to inform HE planning and decrease the gap between education output and job demands.

Recent literature emphasizes the significance of sound labor market information and prediction instruments in enhancing education planning. The interplay between education output and economic requirements is all the more significant in situations like Iraq where the economic structure is strongly determined by oil dependency and structural labor market issues. This enhances the importance of labor market forecasting as a strategic instrument of university planning and distribution of students.

Additionally, the analysis shows the structured career guidance systems have made positive and significant contribution to the effectiveness of student allocation systems. The outcomes highlight the role of pro-amped career direction for informing students' choice and, thus, states that with the help of structured guidance, students are more informed and able to make decisions that are more in line with their abilities, interests, and labor market opportunities. In situations where social and family expectations affect career choices, the quality and relevance of student placement choices can be enhanced by enhancing counselling services.

Furthermore, the findings showed that governance arrangements and policy inputs are important drivers in determining student allocation trends with regards to national development priorities. The analysis suggests that governance structures and policy incentives are meaningful in achieving HE outcomes in terms of students' distribution, and, hence, are important in shaping outcomes aligned with national goals. This suggests that effective governance frameworks and incentives can affect student preferences and enhance the match between education outcomes and national priorities in Iraq.

In addition, the evidence suggest that student allocation is effective if taking enrolment decisions in consideration of the institutional capacity and academic resources. The findings show that the institutional capacity planning is needed to achieve uniformity of the number of students with the level of resources and academic infrastructure. This imperative that HE planning in Iraq needs to manage institutional resources including recruitment, infrastructure, and enrolment capacity. Practically, this implies that the allocation decisions of students should be synchronized with the real capacity of the universities, in order to prevent overcrowding, preservation of the quality of education, and effective utilization of resources. This is especially significant in Iraq where the institutional capacity constraints have the potential to directly influence the quality and results of HE.

The findings further suggests that high levels of academic/industrial interaction can serve as a positive catalyst for strengthening the relevance of academic courses and the employability of graduates. The analysis justifies the need of continued cooperation, industry–academic linkage, to improve the relevance of the academic curriculum, and to help the graduates improve their employability skills. This suggests that greater interaction between universities and industry enhances curriculum relevance and graduate employability in Iraq. In practice, the feedback provided by employers on a regular basis can assist universities in modifying the content of the programs as well as the number of students that are taken in, to better reflect the needs of the labor market. In Iraq, especially, where the disconnect between academic programs and industry needs is an issue, this is especially important.

The conclusion for this hypothesis is that the alignment of priorities of the national development in planning will help in allocation of student in HE to be more pertinent. The result shows that the strategic relevance to student allocation in the socio-economic development context can be increased by producing HE planning based on the country development priority. This suggests that the connection between university education and the country economic and social objectives enhances the relevance and value of HE in Iraq. Practically, this implies that the decision to allocate students should consider areas of priority like infrastructure, energy and public services in order to facilitate national development. This is more so in Iraq where there is still a need to coordinate the planning between the education and economic policy.

While the implications are promising and point towards greater strategic responses to the allocation of students, they do also raise some practical issues. Labor market projections are uncertain and events such as an economic downturn or technological advances as well as unexpected events in the country can affect the labor market projections. Moreover, putting a lot of emphasis on a central planning unit might result in conflicts between students' interests or future work lives (future university life), and what is required in the labor market of this country. Therefore, it would be wise to view strategic allocation of students not as a

system of allocation, but as a guiding mechanism to meet the basic need of the workforce and of course give the student complete freedom of choice.

5.2. Theoretical implications

5.2.1. Theoretical contribution

This study extends the theoretical analysis of strategic student allocation and goes beyond the traditional view of student allocation in the context of the human capital theory that focuses on the direct interface between education output and labor market demand. Although the human capital theory emphasizes education and its contribution to managing skill formation to boost economic productivity, this research finds that a complex and integrated web of institutional and behavioral processes — and not just the signals in the labor market — help determine if human capital is developed effectively.

In particular, the study serves as an attempt to link the human capital theory with complementary explanations from systems thinking theory, institutional theory and career development theory to find a multidimensional explanation of the effectiveness of student allocation. The results reveal that there is no absolute separation between labor market forecasting, career guidance system, governance and policy, university capacities planning, industry – academia linkage and national development alignment. Rather, they are members of an interdependent set that constitutes a single HE system and work together to define the nature, production, guidance and application of human capital.

The study postulates such a multi-level governance and decision-making system as a solution to expand the system of human capital theories; and considers this strategy as an allocating method for students rather than a linear matching education and job model. An intuitive step in this theoretical evolution has been to highlight the importance of i) feedback between economic, institutional and behavioral layers where policy measures, capacities of institutions and course of one's own careers interact constantly and shape each other and ii) the capacity of key economic, institutional and behavioral agents to intervene. This will provide a more comprehensive explanatory explanations for integrating HE systems with needs in a labor market and the country's national development in hard and resource-constrained environments such as Iraq.

5.2.2. Integrated theoretical implications of the study

The findings of this research paper add to the theoretical debates about strategic management in HE by showing that student allocation systems are multi-dimensional and multi-layered systems, as opposed to single mechanisms. The findings largely coincide with the human capital theory [66], that highlights the fact that the education systems create more economic and social value when the output of graduates matches labor market demand. This paper builds on this viewpoint by demonstrating that this alignment is not motivated by one factor, it is the interaction of labor market information, institutional capacity, governing institutions, and the support systems at the student level.

Moreover, the evidence confirms a systems approach, according to which HE institutions are components of a larger socio-economic system. Student allocation effectiveness is thus determined by the coordination of the universities, the government policy and industry needs. This brings out the point that strategic student allocation needs to be perceived as a dynamic process that is influenced by the internal institutional capability, as well as by the external economic conditions.

Additionally, the research adds to the theory by incorporating the views on career development into the analysis of a system. Although the concept of career guidance has been considered at an individual level, the findings indicate that career guidance is also a structural factor in enhancing the efficiency of the system in realizing the student choices in line with the realities of the labor market. This builds on the prevailing theoretical research by connecting personal decision making to institutional and national results. Labor market information and a labor market-based allocation system can provide a more accurate picture of the situation, although forecasting uncertainty and structural volatility in the economy itself might impair the accuracy of such a system. Generally, the research contributes to theory by suggesting that effective systems of distributing students necessitate an interplay between the economic, institutional and behavioral aspects. This combined approach goes beyond the explanations of single theories and offers a more holistic approach to the explanation of how HE systems can be responsive to the labor market and development needs.

5.3. Practical implications

The findings have a number of practical implications on how to enhance the system of student allocation in the Iraqi tertiary education. Universities and policymakers should focus on the application of labor market information in decisions about the allocation of students in the short term. A combination of economic sector analysis and forecasting instruments can assist institutions to modify the trends of enrolment to mitigate skills mismatch and enhance the employability of graduates. Meanwhile, the development and professionalization of career guidance and counselling services should be promoted. More informed and

realistic educational decisions can be assisted by availing students with the correct information regarding career opportunities and labor market trends.

Enhancement of governance mechanisms is also imperative. Fairness, consistency, and accountability of the student placement processes can be enhanced by having clear policies, clear allocation criteria, and effective monitoring systems. Moreover, the universities ought to match the number of students they take in with the capacity they have by making sure that the infrastructure, faculty and availability of the programs are sufficient to meet the demand of the students without undermining the quality.

There should be greater co-operation between universities and the industry in the long term in order to make academic programs to be relevant to the labor market demands. The development of the curriculum and the enhancement of the appropriate matching of graduate skills and industry expectations can be facilitated by establishing a system of continuous feedback with employers. Moreover, planning of HE should be in line with the national development priorities in order to realize the strategic positioning of universities in economic and social growth. All in all, to enhance the system of student allocation in Iraq, the work on the problem should be conducted at the institutional, policy and economic levels. The combination of labor market information, student support mechanisms, institutional capability, and national planning can be used to create a balanced strategy to increase educational achievement and labor market fit.

6. THE FRAMEWORK OF MULTIMODAL IMPLEMENTATION

The translation of strategic student allocation policies into operational practice needs to have integrated implementation architecture which links together various institutional actors, data systems and governance mechanisms. The empirical evidence of the present research is used to suggest a multimodal implementation framework that will be used to bring the strategic student allocation system to life in the Iraqi higher education context. The framework, as shown in Figure 2, has been referred to as being multimodal in that it combines multiple and complementary policy tools and institutional processes, such as economic forecasting systems, governance mechanisms, institutional planning processes, student guidance processes, and industry feedback channels.

The initial part of the framework entails the creation of a national economic forecasting as well as labor market intelligence system. The Ministry of Planning should organize this mechanism with the national statistical agencies and ministries. The main aim of this system is to produce medium and long-term predictions of workforce demand in the key sectors of the economy in the energy, agricultural, healthcare, education, information technology, and manufacturing. The forecasting unit can use evidence-based forecasts of the future labor demand by incorporating the macroeconomic indicators, sectoral development strategies, and demographic projections. These projections form the underlying layer of data on which strategic decisions of student's allocation can be built.

The second element is the governmental translation of policies and alignment of regulations. After generating labor market projections, the Ministry of Higher Education in consultation with the Ministry of Education and the Ministry of Planning can then convert these projections into strategic enrolment goals in the universities. The policy tools can consist of admission quotas, targeted scholarship programs, tuition incentives and priority funding of academic programs based on national development priorities. Notably, these tools must not rule out student choice but, instead, they should influence the educational choice via systematic incentives and open information systems.

The third mode of implementation targets institutional capacity planning in institutions of higher learning. Universities should match the workforce needs as forecasted with their academic infrastructure, faculty recruitment and their program capacities. This involves internal planning processes that are systematic where the universities periodically review the demand on programs, faculty, laboratory facilities and instructional resources. Strategic capacity planning is a way of ensuring that the growth in the number of students enrolled in priority courses is accompanied by sufficient educational quality and institutional capacity.

The fourth element in the framework is the career guidance and student decision support systems. Strategic student allocation policy requires students to be able to access trustworthy information about the opportunities of the labor market, career opportunities, and education avenues. Universities and secondary schools should hence create professional career counselling units fitted with labor market statistics, aptitude testing instruments, as well as virtual career data websites. Such systems will be able to help the students in matching their individual interests and skills to the new economic opportunities and hence minimize the gap between the supply of graduates and the demand in the labor markets.

The fifth element is organized industry-academia partnership and feedback. The employers, industry associations and professional bodies are critical in ensuring real time information in the skill requirements, technology change and needs in the sector. Some of the institutional mechanisms that may be used to channel this feedback to the universities by the labor market include industry advisory boards, internship programs,

graduate employment tracking systems, and research partnerships. Such feedback allows the universities and policymakers to revise the program offering, and policies regarding student allocation, based on the evolving economic trends.

Lastly, the structure includes an ongoing cycle of monitoring and adjustment of policy. The strategic student allocation systems should be flexible to economic changes, technology and demographics trends. The government agencies are therefore encouraged to have monitoring mechanisms in place in order to monitor the results of graduate employment, skills shortage in the sector, as well as the indicators of the program performance. The allocation system transforms into a dynamic governance system through periodic policy review and information-based changes that can ensure long-term consistency in achieving national priorities of HE outputs and national development.

The proposed framework combines these five modalities, namely, economic forecasting, coordination of government policies, institutional capacity planning, career guidance system, and industry feedback mechanism, which offers a comprehensive framework of operations of applying evidence-based student allocation policies. Such a framework will provide a viable avenue to enhancing the enhancement of alignment of HE and national workforce development strategies in the Iraqi context, which will lead to economic diversification, human capital maximization and long-term sustainable development.

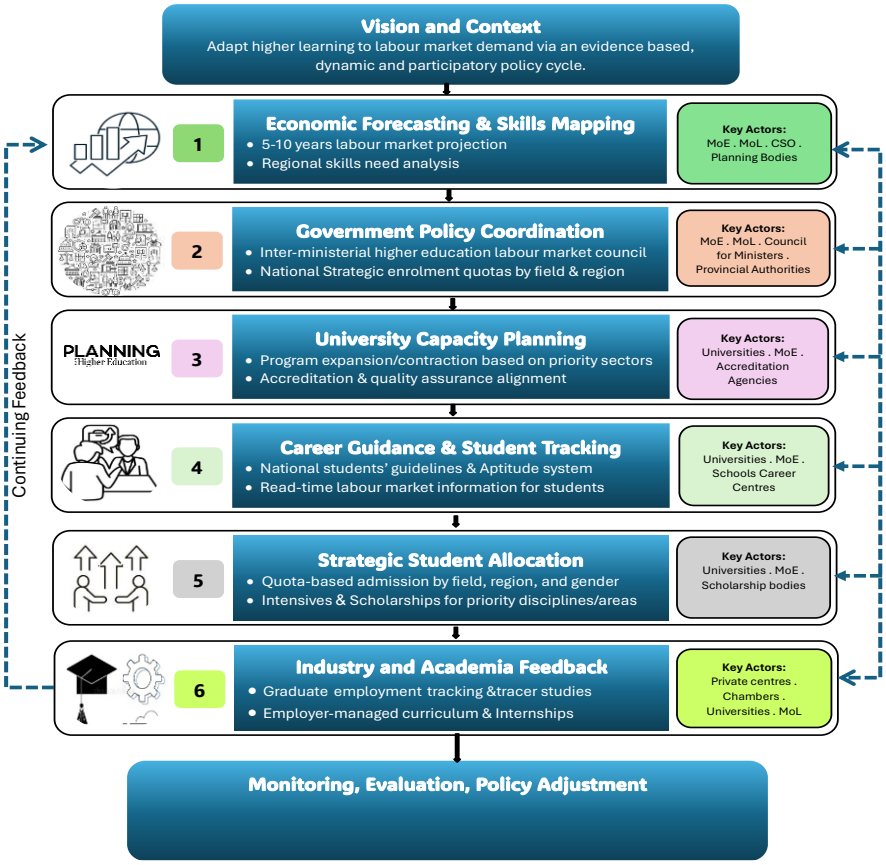


Figure 2. Multimodal framework of strategic student allocation in the context of Iraqi higher education

7. FUTURE WORK

Despite the fact that the current study offers a good understanding of the design of evidence-based student allocation systems, there are still a few opportunities that can be explored in the future. First, future research can utilize longitudinal designs to test the effects of strategic allocation policies on graduate employment achievement in the long-term. Second, a comparative study of various countries in the Middle East and in other post-conflict settings would shed more light on the external validity of the suggested framework. Third, in future research, more sophisticated methods of analysis may be used, including structural equation modelling or system dynamics modelling, to provide an opportunity to grasp the intricate relationships between institutional, economic, and policy variables driving student allocation systems.

8. CONCLUSION

This study shows that tight strategic planning for the distribution of students in the Iraqi higher education system contributes to building a solid and tight economy and that this process is subject to many interdependent factors, such as labor market forecasting, career guidance, incentives in the government's policy to study in the HE sector, and capacity planning of Iraqi institutions. Collaboration between industry and academia, and alignment with national development priorities. The evidence does reveal that an integrated approach towards student allocation is more effective in achieving system effectiveness and achievement than are individual policy measures. The study has important theoretical and empirical implications; it is theorized and tested a multi-model student allocation framework including the economic, institutional and governance aspects in a single model. This addresses a centrality gap found in previously published literature on the student allocations which have largely been confined to one factor or partial explanations for the allocations and integration, not at a system level, particularly in a post-conflict context.

Practice-wise the outcomes identify the need to utilize evidence driven approaches and tools to plan, linking, coordinating and synthesizing the inter-related components of labor market intelligence, institutional capacity and the country's goals of higher education sector development of the institutions and policy maker. Enhancing coordination within ministries, universities, and industry sectors can help streamline and make allocation of students to jobs more efficient and relevant, which in turn will boost the employability of graduates in the workforce, and support long-term development goals for the nation.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
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R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

The data of this research are available upon reasonable request from the corresponding author [AJK].

REFERENCES

[1] E. Abu Sa'a and A. Gunnarsson, "Gaining from university-industry collaboration: Considerations for less experienced firms," *Journal of Technology Transfer*, vol. 51, pp. 880–910, 2026, doi: 10.1007/s10961-025-10244-4.
[2] UNESCO Institute for Statistics, *SDG 4 Country Profile: Iraq*. UNESCO, 2025. Accessed: Feb. 12, 2026. [Online]. Available: http://download.uis.unesco.org/SDG4/SDG4-Profile-Iraq.pdf.
[3] T. Staunton, "Career Guidance and Digital Induction," *Nordic Journal of Transitions, Careers and Guidance*, vol. 6, no. 1, pp. 14–25, 2025, doi: 10.16993/njtcg.73.

[4] B. C. Lin and C. H. Lee, "Assessing the efficacy of adaptive capacity-building strategies in earthquake-prone communities," *Geomatics, Natural Hazards and Risk*, vol. 15, no. 1, 2024, doi: 10.1080/19475705.2024.2380908.

[5] G. S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago, IL, USA: University of Chicago Press, 1964.

[6] G. Psacharopoulos and H. A. Patrinos, "Returns to investment in education: a decennial review of the global literature," *Education Economics*, vol. 26, no. 5, pp. 445–458, 2018, doi: 10.1080/09645292.2018.1484426.

[7] L. Graf and A. P. Lohse, "Conditions for cross-border policy transfer and cooperation: Analysing differences between higher education and vocational," *Research in Comparative and International Education*, vol. 16, no. 4, pp. 361–383, 2021, doi: 10.1177/17454999211057747.

[8] J. E. H. Bright and R. G. L. Pryor, "The chaos theory of careers: A user's guide," *Career Development Quarterly*, vol. 53, no. 4, pp. 291–305, 2005, doi: 10.1002/j.2161-0045.2005.tb00660.x.

[9] D. Autor, D. Mindell, and E. Reynolds, *The Work of the Future: Building Better Jobs in an Age of Intelligent Machines*, MIT Press, 2020.

[10] E. Brynjolfsson and T. Mitchell, "What can machine learning do? Workforce implications," *Science*, vol. 358, no. 6370, pp. 1530–1534, 2017, doi: 10.1126/science.aap8062.

[11] R. Baldwin, "EAEA16 Keynote Address: The Future of Globalization," *Asian Economic Journal*, vol. 33, no. 1, pp. 3–12, 2019, doi: 10.1111/asej.12168.

[12] D. Rodrik, "New technologies, global value chains, and developing economies," National Bureau of Economic Research Working Paper Series, no. 25164, 2018, doi: 10.3386/w25164.

[13] R. Assaad and C. Krafft, "Labour market dynamics and youth unemployment in the Middle East and North Africa: Evidence from Egypt, Jordan, and Tunisia," *Labour*, vol. 37, no. 4, pp. 519–553, 2023, doi: 10.1111/labr.12257.

[14] S. E. El-Kogali and C. Krafft, *Expectations and Aspirations: A New Framework for Education in the Middle East and North Africa*. Washington, DC: World Bank, 2020, doi: 10.1596/978-1-4648-1234-7.

[15] C. Jo, D. H. Kim, and J. W. Lee, "Forecasting unemployment and employment: A system dynamics approach," *Technological Forecasting and Social Change*, vol. 194, p. 122715, 2023, doi: 10.1016/j.techfore.2023.122715.

[16] B. Radcliffe, "Impact of Education and Training on Economic Growth," *Investopedia*, 2024. Accessed: Jan. 03, 2026. [Online]. Available: https://www.investopedia.com/articles/economics/09/education-training-advantages.asp.

[17] C. B. Frey and M. A. Osborne, "The future of employment: How susceptible are jobs to computerization?" *Technological Forecasting and Social Change*, vol. 114, pp. 254–280, 2017, doi: 10.1016/j.techfore.2016.08.019.

[18] World Bank, *Human Capital Project: Key Reports*. World Bank Group, 2022. Accessed: Dec. 12, 2025. [Online]. Available: https://www.worldbank.org/en/publication/human-capital/brief/human-capital-project-key-reports.

[19] M. L. Savickas, "The Theory and Practice of Career Construction," in *Career Development and Counseling: Putting Theory and Research to Work*, 2nd ed., Hoboken, NJ, USA: John Wiley & Sons, 2005, pp. 42–70.

[20] D. Wang and Y. Li, "Career construction theory: Tools, interventions, and future trends," *Frontiers in Psychology*, vol. 15, p. 1381233, 2024, doi: 10.3389/fpsyg.2024.1381233.

[21] M. A. Dev and N. B. Arlı, "The role of personality traits and decision-making styles in career decision-making difficulties," *Behavioral Sciences*, vol. 15, no. 2, p. 159, 2025, doi: 10.3390/bs15020159.

[22] N. Sharapova, S. Zholdasbekova, S. Arzymbetova, O. Zaimoglu, and G. Bozshatayeva, "Efficacy of school-based career guidance interventions: A review of recent research," *Journal of Education and e-Learning Research*, vol. 10, no. 2, pp. 215–222, 2023, doi: 10.20448/jeelr.v10i2.4554.

[23] A.-K. Kleine, A. Schmitt, and B. Wisse, "Students' career exploration: A meta-analysis," *Journal of Vocational Behavior*, vol. 131, p. 103645, 2021, doi: 10.1016/j.jvb.2021.103645.

[24] Z. Keshf and S. Khanum, "Career guidance and counseling needs in a developing country's context: A qualitative study," *SAGE Open*, vol. 11, no. 3, 2021, doi: 10.1177/21582440211040119.

[25] C. Yao and I. McWha-Hermann, "Contextualizing career development: Cultural affordances as the missing link in social cognitive career theory," *Journal of Vocational Behavior*, vol. 159, p. 104114, 2025, doi: 10.1016/j.jvb.2025.104114.

[26] S. Athey and E. Palikot, "The value of non-traditional credentials in the labor market," *arXiv preprint* arXiv:2405.00247, 2024, doi: 10.48550/arXiv.2405.00247.

[27] N. Whelan, S. McGilloway, M. P. Murphy, and C. McGuinness, "EEPIC—Enhancing employability through positive interventions for improving career potential: The impact of a high support career guidance intervention on the wellbeing, hopefulness, self-efficacy and employability of the long-term unemployed—a study protocol for a randomised controlled trial," *Trials*, vol. 19, p. 141, 2018, doi: 10.1186/s13063-018-2485-y.

[28] M. Rezaiee and H. Kareshki, "Empowering career pathways: Integrating self-regulation strategies with career counseling practices," *Frontiers in Education*, vol. 9, 2024, doi: 10.3389/feduc.2024.1422692.

[29] C. Zilai, "Empirical research on student satisfaction with career services in a public universities," *SAGE Open*, vol. 14, no. 4, 2024, doi: 10.1177/21582440241286360.

[30] C. A. Dunlop, C. M. Radaelli, E. Wayenberg, and B. L. Zaki, "Policy learning and policy innovation: interactions and intersections," *Policy & Politics*, vol. 46, no. 4, pp. 547–563, 2024, doi: 10.1332/03055736Y2024D000000049.

[31] A. Hortal, "Thriving by design: Can behavioral economics and public policy shape virtuous lives?" *Behanomics*, vol. 2, pp. 106–128, 2024, doi: 10.55223/bej.15.

[32] L. Gleyo, "Quotas for scholarship recipients: An efficient race-neutral alternative to affirmative action?" arXiv, arXiv:2507.17191, 2025, doi: 10.48550/arxiv.2507.17191.

[33] L. Hatsor and R. Bar-El, "Higher education funding: The value of choice," arXiv, arXiv:2411.05506, 2024, doi: 10.48550/arxiv.2411.05506.

[34] C. Light, G. E. Nwaobia, and L. I. Nwobia, "Effects of conditional and unconditional cash transfers on poverty reduction, education, and health outcomes in Sub-Saharan Africa—A PRISMA approach," *Journal of Poverty*, vol. 30, no. 5, pp. 563–609, 2026, doi: 10.1080/10875549.2024.2426807.

[35] R. Jain and B. J. Tan, "The effects of classroom incentives: Experimental evidence from Kenya," *Economics of Education Review*, vol. 110, p. 102757, 2026, doi: 10.1016/j.econedurev.2025.102757.

[36] S. Arif, R. W. Nihayah, S. Usman, and N. Rarasati, "Does decentralisation promote learning? Local political settlements and education policies in Indonesia," *Compare: A Journal of Comparative and International Education*, vol. 55, no. 6, pp. 992–1010, 2024, doi: 10.1080/03057925.2024.2344523.

[37] U. Muhdiarta, "Investigating the challenges of bureaucratic reform in developing countries: A case study approach," *Ilomata International Journal of Social Science*, vol. 6, no. 2, pp. 689–702, 2025, doi: 10.61194/ijss.v6i2.1687.

[38] A. Mowreader, "Career coaching can aid student success, but not every student receives guidance," *Inside Higher Ed*, Oct. 2024. Accessed: Jan. 20, 2026. [Online]. Available: https://www.insidehighered.com/news/student-success/life-after-college/2024/10/09/majority-college-students-lack-education-career.
[39] J. Vargas, M. A. Abeel, F. Sullivan, A. Danielsen, and A. Goldberg, "Career decision-making support for youth before the 'moment of choice'," *Jobs for the Future*, Aug. 2023. Accessed: Mar. 06, 2026. [Online]. Available: https://www.jff.org/idea/career-decision-making-support-for-youth-before-the-moment-of-choice/.
[40] C. Corduneanu-Huci, M. T. Dorsch, and P. Maarek, "Policy evaluation in polarized polities: The case of randomized controlled trials," *The Journal of Development Studies*, vol. 60, no. 5, pp. 645–661, 2023, doi: 10.1080/00220388.2023.2284673.
[41] H. White, "An introduction to the use of randomized control trials to evaluate development interventions," *International Initiative for Impact Evaluation*, 2024. Accessed: Aug. 11, 2025. [Online]. Available: https://www.3ieimpact.org/evidence-hub/publications/working-papers/introduction-use-randomized-control-trials-evaluate.
[42] O. Celebi and J. P. Flynn, "Adaptive priority mechanisms," in *American Economic Association Conference Papers*, 2024. [Online]. Available: https://www.aeaweb.org/conference/2024/program/paper/bH3fFDrS.
[43] S. J. Eckert and M. McCoy, "The Benefits of Behavioral Nudges: Using Choice Architecture to Improve Decisions and Shape Outcomes in Retirement Savings Programs," *Financial Planning Association Journal*, 2024.
[44] S. Mertens, M. Herberz, U. J. J. Hahnel, and T. Brosch, "The effectiveness of nudging: A meta-analysis of choice architecture interventions across behavioral domains," *Proceedings of the National Academy of Sciences*, vol. 119, no. 1, p. e2107346118, 2021, doi: 10.1073/pnas.2107346118.
[45] L. G. P. Ferrero and S. L. M. Salles-Filho, "Planning and resource allocation models in research-intensive universities: budget allocation and the search for excellence," *Humanities and Social Sciences Communications*, vol. 12, p. 482, 2025, doi: 10.1057/s41599-025-04778-z.
[46] J. Renick, A. Furco, E. M. Janke, and E. J. Ozer, "More than just money: Strategic allocation of resources to support community-engaged scholarship," *Innovations in Higher Education*, 2025, doi: 10.1007/s10755-025-09831-y.
[47] M. Salajegheh, J. Sandars, A. Mirzazadeh, and R. Gandomkar, "Understanding the capacity development of faculty development programs: A sequential explanatory mixed methods study," *BMC Medical Education*, vol. 24, p. 744, 2024, doi: 10.1186/s12909-024-05715-5.
[48] K. Wang, B. Li, T. Tian, N. Zakuan, and P. Rani, "Evaluate the drivers for digital transformation in higher education institutions in the era of Industry 4.0 based on decision-making method," *Journal of Innovation & Knowledge*, vol. 8, no. 3, p. 100364, 2023, doi: 10.1016/j.jik.2023.100364.
[49] A. Biloshchytskyi, A. Mukhatayev, O. Kuchanskyi, S. Omirbayev, Y. Andrashko, and S. Biloshchytska, "Method for assessing quality assurance in higher education institutions," *TEM Journal*, vol. 14, no. 1, pp. 372–386, 2025, doi: 10.18421/TEM141-33.
[50] J. Knight, "Higher education cooperation at the regional level," *Journal of International and Comparative Education*, vol. 26, no. 1, pp. 101–115, 2024, doi: 10.1108/JICE-09-2023-0021.
[51] Q. Yang, C. Wang, H. Ying, H. Jiang, and Z. Fu, "Review on barriers and drivers of university–industry collaborative innovation: A stakeholder perspective," *Sustainable Futures*, vol. 9, p. 100771, 2025, doi: 10.1016/j.sftr.2025.100771.
[52] A. L. Rossoni, E. P. G. de Vasconcellos, and R. L. Rossoni, "Barriers and facilitators of university-industry collaboration for research, development, and innovation: A systematic review," *Management Review Quarterly*, vol. 74, pp. 1841–1877, 2024, doi: 10.1007/s11301-023-00349-1.
[53] Q. T. Dang, H. G. Rammal, and T. Q. Nguyen, "University-industry knowledge collaborations in emerging countries: the outcomes and effectiveness in Vietnam," *Knowledge Management Research & Practice*, vol. 22, no. 6, pp. 600–619, 2024, doi: 10.1080/14778238.2024.2355924.
[54] K. F. Schneider, "Intermediaries (not) in action: Impediments to initiating the university-industry knowledge transfer," *Technology in Society*, vol. 78, p. 102672, 2024, doi: 10.1016/j.techsoc.2024.102672.
[55] A. Vuoriainen *et al.*, "The six C's of successful higher education-industry collaboration in engineering education: A systematic literature review," *European Journal of Engineering Education*, vol. 50, no. 1, pp. 26–50, 2025, doi: 10.1080/03043797.2024.2432440.
[56] L. Shi and L. Wang, "Understanding university-industry collaboration from the perspective of proximity: Insights from a case study in China," *Technology Analysis & Strategic Management*, vol. 36, no. 12, pp. 4380–4392, 2023, doi: 10.1080/09537325.2023.2251606.
[57] Y. Zhang and B. Liu, "Impact of university-industry collaboration portfolio partnership repeatedness on radical innovation," *Academy of Management Proceedings*, vol. 2024, no. 1, 2024, doi: 10.5465/AMPROC.2024.17997.
[58] B. Levy, "How political contexts influence education systems: patterns, constraints, entry points," *RISE Working Paper Series*, 2022, doi: 10.35489/BSG-RISE-WP_2022/122.
[59] R. Baillargeon, "The object concept revisited: New directions in the investigation of infants' physical knowledge," in *Visual Perception and Cognition in Infancy*, Psychology Press, 2013, pp. 265–316.
[60] P. Garibaldi, P. Gomes, and T. Sopraseuth, "Output costs of education and skill mismatch in OECD countries," *Economics Letters*, vol. 250, p. 112278, 2025, doi: 10.1016/j.econlet.2025.112278.
[61] P. Khatri, H. K. Duggal, W. M. Lim, A. Thomas, and A. Shiva, "Student well-being in higher education: Scale development and validation with implications for management education," *The International Journal of Management Education*, vol. 22, no. 1, p. 100933, 2024, doi: 10.1016/j.ijme.2024.100933.
[62] R. J. Wang, S. Lin, M. Tseng, M.-H. Tsai, and T.-H. Chang, "Measuring college campus well-being with multidimensional indicators," *Sustainability*, vol. 14, no. 14, p. 8260, 2022, doi: 10.3390/su14148260.
[63] L. J. Cronbach, "Coefficient alpha and the internal structure of tests," *Psychometrika*, vol. 16, no. 3, pp. 297–334, 1951, doi: 10.1007/BF02310555.
[64] H. H. Harman, *Modern Factor Analysis*, 2nd ed. Chicago, IL, USA: University of Chicago Press, 1967.
[65] M. H. Kutner, C. J. Nachtsheim, J. Neter, and W. Li, *Applied Linear Statistical Models*, 5th ed. New York, NY, USA: McGraw-Hill/Irwin, 2005.
[66] G. S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, 3rd ed. Chicago, IL, USA: University of Chicago Press, 1993.

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