



REFRAMING EDUCATION SYSTEMS THROUGH HUMAN CAPITAL DEVELOPMENT: A SYSTEMATIC LITERATURE REVIEW ON SKILLS, LEADERSHIP, AND SUSTAINABILITY

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Abstract

The pervasiveness of rapid technological change, globalization and demands for sustainability suggests that the common reliance on schools to develop flexible human capital faces a regime of choice¹ in terms of what kind of individuals we expect the education system to produce. While investments in education have been growing, human capital development is still not well-aligned with labor market demands and national goals for sustainable development two areas of interest that this study will explore, focusing on how it relates to educational settings using a systematic literature review. This study utilizes qualitative approach by conducting literature analysis of national or international articles and processed with four stages namely identification, selection, evaluation, and synthesis stage on data. Investment in education improved skills and increased productivity, whilst leadership notably transformational and sustainable leadership plays a key role in enhancing motivation, adaptability as well as institutional performance. Moreover, the incorporation of digital devices not only enhances efficacy in learning and accessibility but also addressing to general inequality in access is still a big challenge. This offers an indication that the development of human capital may be effective if it comes with an ensemble approach, combining skills development and leadership of changing education systems. This study advances the literature on responsive and sustainable education systems, offering policymakers and educational institutions a comprehensive framework for designing their respective responses.

Keywords: *Human capital, education systems, leadership, skills, sustainability*

INTRODUCTION

Education systems globally are going through rapid changes. This shift was bolstered by technological advances, capitalism and growing demands of sustainable development. In this sense, human capital is a relevant topic of discourse as education aims at instilling knowledge and skills and attitudes in people compartmentalising the last for their potential to provide value on society and work [1]. Generally, human capital is assumed to refer to the knowledge, skills and other personal attributes that the individuals accumulate through schooling and experience. However, the challenges we have today show that education cannot be only about academic content knowledge anymore. Learners need to be ready to address change, dysfunctional characteristics and the economic up-turn [2].

Although many countries have invested heavily in education, schools and universities can still differ widely from what the labor market needs [3]. Other essential skills in which Graduates remain seen to be lacking include: ugly critical thinking, digital literacy, leadership and communication and adaptability. This poses an even greater challenge in contexts where access to quality education and digital technology remain highly unequal – a problem aggravated by COVID-19 [4]. This raises the need to revisit the nature of human capital that education systems should foster.



This study, in particular is based on human capital theory which states that investment in education and training = higher individual productivity + economic growth [5]. This theory matured into a more general approach in renewed studies. Human capital not only via cognitive ability or technical skills but also via leadership, innovation capacity (leadership with impact change), digital readiness and sustainability-oriented values. Traditional skills have expanded to include technical knowledge, including socio-emotional skills, problem solving, creativity and lifelong learnability [6].

Also, Creating the human capital requires great leadership. In education, the leadership you exhibit influences your institutions response to change, innovation and shaping learning. Such as transformational and sustainable leadership to promote all adaptivity learners, educators, and institutions. Extending this further, education has been another important domain area that has benefitted from digital technology with availability, participation and flexible access [8]. Moreover, technology does have its downsides especially negative sentiments towards the less fortunate amongst us who do not have equal access to appropriate digital tools and the internet.

Past research has dealt with education, skills, leadership and technology which is related to how human capital evolves. For instance, Hanushek and Woessmann (2020) note the positive impact of education investments on productivity in labour markets and other economic outcomes over larger time-frames [7]. This and other studies show the positive correlation between educational leadership, teacher performance, student achievement and institutional effectiveness. However, most of these investigations still assume that elements are distinct from one another. In practice, you have the individual topics skills development; leadership; technology and sustainability [9].

There is a major lack of research here. Nonetheless, few studies evidently relate these components together in a single discourse, notably in the context of sustainable development and SDGs [10]. Therefore, the current paper aims to review and synthesis of Literature in education systems linked with human capital development interconnections between skills, leadership, technology integration and sustainability.

Based on education systems of today this study addresses three questions: A. How human capital formation is interpreted? B. Roles of leadership, technology and skills in adaptive learning environments; C. Sustainable development outcomes that will be facilitated by these elements? To answer these questions, this research adopts by using a systematic literature review (SLR) approach identifying, selecting, evaluating and synthesizing relevant national as well as international studies.

However, the innovative aspect of this particular study is that it looks at data holistically. Links skills, leadership, technology and sustainability as interrelated domains of human capital capacity pertaining to research. This new perspective is expected to expand the bounds of theory-human capital on sustainable development outcomes in a comprehensive way. In an education context, the findings may help steer policymakers, educators and institutional leaders to design more appropriate systems that are better aligned with contemporary and future demands. Referentially please be reminded that the ultimate goal of human capital development should not only be towards economic productivity but also for social responsibility and environmental sustainability.

METHOD

This qualitatively designed study applies a systematic literature review (SLR) approach. It also highlights this approach in relation to human capital development in education systems specifically by skill, leadership and sustainability. This study utilized the PRISMA framework but employed a modified version for clarifying the evidence synthesis process. PRISMA also aid readers in understanding how literature was searched, filtered, evaluated and selected result with the more transparency of the research

process.

PRISMA diagram illustrating the entire flow of article selection for this review. There are read more in four main stages: Identification, Screening (Phase I), Eligibility (Phase II) and Inclusion. You go through all THESE steps to get from this massive pool of studies down to the most relevant ones, only at that point you finally choose. Therefore this diagram is most certainly not only a visual element but also proof that we carry out our selection process orderly.

The first stage is identification. In this step, academic databases such as Scopus, Web of Science, ScienceDirect and Google Scholar are used for articles. Search phrase human capital development education systems skills leadership and sustainable The we intend is to present short summary of as many relevant studies as possible. After collecting the articles, duplicates are removed to ensure that the same study cannot be counted several times.

The next stage is screening. At this stage the titles and abstracts of articles are screened to Excluded are articles that were out of scope. If a study only covers education, human capital, skills and does not cover leadership or sustainability it would be filtered to the next step. This is required so that only those articles having a valid link to the subject under investigation should remain.

The eligibility phase then screens all of the remaining articles that have not been cited already. All articles are read in detail (text full) at this time. Screening excluded articles based on relevance with the research objectives, clarity of method and contribution towards answering the questions posed around human capital in education. Any article which did not meet one of these criteria or did not provide sufficient analysis was excluded from the review.

The final stage is inclusion. In this stage, the articles reasonably matches are taken as a study primer. Subsequently, a thematic analysis was conducted on these chosen studies. The analysis was focused on identifying the broad themes related to skills, leadership capacity and sustainability integration for each education system.

In summary, the PRISMA process described in this study is a new aid to methodology that will take the literature from a large pool of sources down to more specific data. This process allows for a much more rational, optically transparent and well organized study. This also ensures that the results are by literature suitable to addressing research questions, is relevant and credible.

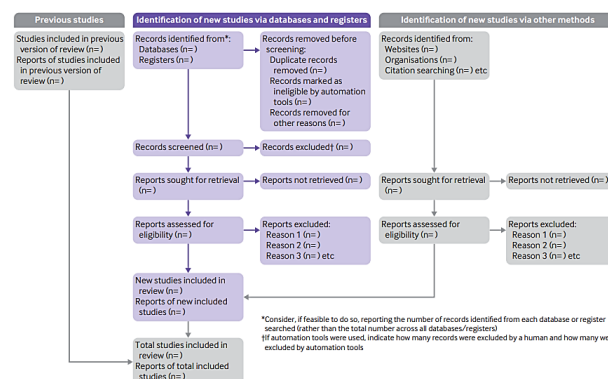


Fig. 1 PRISMA 2020 Flow Diagram Template For Systematic Reviews

source: Adapted from Page et al. (2021)

RESULTS AND DISCUSSION

The systematic literature review method, framed under the PRISMA analysis approach, was employed to identify studies in educational systems relating to human capital development, leadership and sustainability. A case search found 629 articles from some academic databases. Filtration process The first step in this study was to evaluate the articles identified through citing, and exclude duplicate or less relevant ones from the results. Overall, 10 studies were included as they were relevant/appropriate study types which addressed the focus of this research.

The selection process of these articles is depicted in the PRISMA flow diagram (Figure 2), which consists of identification, screening, eligibility, and final inclusion. This process makes the selection of literature more transparent and systematic, so that studies included in the review provide relevant evidence to inform or support the analysis.

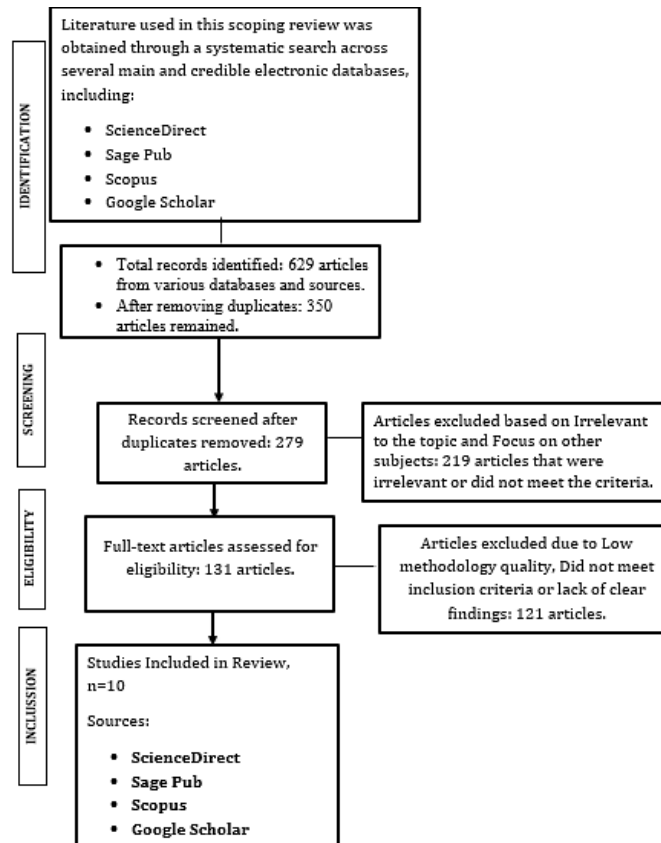


Fig.2 PRISMA Diagram

Source: Author's Analysis



Table 1. Summary of Selected Studies (PRISMA Results).

No	Author(s), Year & Title	Research Method	Key Findings
1	Sairmaly (2023) – Human Capital & Economic Growth	Literature Review	Human capital improves economic growth
2	Haq (2024) – Situational Leadership	PRISMA Review	Situational leadership is effective for HR development
3	Iqbal & Piwowar (2022) – Sustainable Leadership	SEM	SL → innovation → performance
4	Yang et al. (2023) – Leadership Capability	SEM	Leadership has no direct effect on performance
5	Sumual et al. (2024) – Human Capital Investment	Qualitative	Human capital investment improves HR quality
6	Gunawan et al. (2021) – HR Empowerment	Mixed Method	HR model improves teacher performance
7	Indriani et al. (2026) – Transformational Leadership	Literature Review	TL improves motivation and digital adaptability
8	Sugiyanto (2025) – Leadership & Education Quality	Systematic Review	Leadership improves education quality
9	Sofiyanti (2025) – Sustainable Leadership & ESD	SEM	SL → ESD → innovation
10	Sucipto et al. (2023) – Moral Human Capital	Qualitative	Ethics are essential for sustainable HR development

Source: Author's Analysis

The literature covered by the selected papers start with Saima Sairmaly 2023: Human Capital Development and Economic Growth. This text is an example of a descriptive literature review study [4] with a hypothesis that makes a case for strategic investment in education, IT and skills development to enable or speed-up economic growth. The results illustrate that human capital is not simply one more element but rather an essential and central building block of the essential elements necessary to improve performance and promote competitiveness at the organizational level. Correspondingly, Tigle et al. (2015), which align with this view, as further supported by the research of Sumual et al. (2024) titled Investment in Human Capital from Education. Their main point is that systemic and long-term investment in people as a broader category of human development engenders quality in higher education, thereby improving institutional competitiveness [12]. These two types of research findings together suggest that developing human capital is not a one-time process, but rather an ongoing and adaptive process where systems are quickening in their pace of change and development in order to meet the rapid-fire challenges associated with encroaching globalization.

Building on this, Haq and Roesminingsih (2024) continued a systematic literature review using PRISMA to investigate the “Situational Leadership Skills” in a methodologically rigorous manner. The analysis culminated in the finding that situational leadership is capable of significantly improving quality of human resources, especially for early childhood education professionals [2]. Reflecting upon this finding exemplifies the barriers and opportunities of organizational flexibility that enable leaders to exercise conservative management yet also engendered a responsive approach, including adjusting leadership styles in keeping with the changing requirements and demands placed upon their institutions. In a similar study, the research by Sugiyanto (2025) with the title

Leadership Styles and Education Quality identified leadership had a positive impact on educational quality and institutional management outcomes [13]. Such insights, to the extent that they hold up, have deep implications — leadership is not just about managing people but rather determining and executing institutional strategy in ways that correlate with superior institutional performance.

A study by Indriani et al. This research, published in Transformational Leadership (2026) is another major contribution to the field of study. This study highlights that transformational leadership has an important positive influence, in contrast to Directive Management or Servant Leadership, on motivation and capacity for rapid adjustment [14]. This is especially relevant in the current scenario where educational institutions have to adapt with the rapid growth of digitalization. Adaptive institutions therefore need leaders who are able to motivate teams, nudge innovation and drive organizational change. Along with this, Gunawan et al. through the study of the “HR Empowerment Model” to improve teacher performance that is more in-depth by Fuad et al. (2021) [15] shows that strong leadership is not just about issuing orders but involves providing support, opportunities and the freedom to practice knowledge and grow.

Taken together, these studies demonstrate that the relationship between leadership and performance is complicated. Finally, while it seems intuitive that the more effective a leader is in working with employees would increase firm performance. These results are echoed in an article entitled Leadership, Capability and Performance, by Thokozani T. Mathe, Michelle K. Eagan, Edwin C. Mummery (2023) which demonstrates that leadership does not design the perception of organizational performance directly. In contrast, much of its influence is transmitted through core processes of organizational capacity and a continuous learning culture [16]. At the individual level however, if your internal capacities are weak and your organization lacks a culture of learning, you will struggle to lead through change. In other words, leadership empowers people while solidifying the institutional framework in a fashion that improves performance.

Aside from these themes, several studies also shed light on the dimension of sustainability. Iqbal and Piwovar propose in Sustainable Leadership in Higher Education Institutions a hypothesis that sustainable leadership contributes to the organizational performance through social innovation [17]. Findings demonstrate that leadership which focuses on sustainable futures encourages not only human, but institutional performance over the long term. In line with this, the study Sustainable Leadership and Education for Sustainable Development (ESD) by Sofiyanti (2025) found that sustainable leadership plays a vital role to explore ways effectively adopted in engaging ESD in higher education institutions leading to innovative outcomes [18]. One important takeaway from all of this is that sustainability, as an concept, needs to find its way into the context of education in response to pressing global issues like ecological damage biodiversity extinction social injustice climate change digital transformation and economic inequality

Adopting sustainability principles in education is indicative of an institutional view that aims to do more than simply meet immediate academic achievement targets. Modern educational institutions are expected to prepare academically competent graduates who can play a constructive role in self-sustainable development goals. In this context, leadership is crucial in foundationalizing sustainability values into the institutional culture, curriculum development, and policy directions. Education for Sustainable Development (ESD) further equips learners with such competencies that enable them to



comprehend, respond to and be active players in complex sustainable development challenges [19].

Based on the synthesis of the information from the chosen studies, three overall themes clearly materialize. Investment on human capital to improve quality of education, productivity and competitiveness [20]. This investment in education, training, and skills development help to create competent, flexible and resilient people. Second, while leadership is a powerful determinant of institutional success there are conditions around those effects that includes capacity for innovation and learning culture. Third, sustainability is already the centre piece around which education systems revolve and without it education institutions would not exist in many cases. By embedding sustainability into institutions, they can remain relevant by encouraging innovation and embracing new sustainability-based leadership styles and integrating Education for Sustainable Development enabling them to be successful in the long run.

In conclusion, this systematic review of the literature clarifies the complex connections between human capital, leadership and sustainable school systems. These three components reciprocally support one another, together providing institutions with the tools and strategies needed to successfully respond to progress in technology and the issues that humanity faces around the globe. With strategic human capital development, ongoing evaluation of adaptive and transformational leadership practices, and embedding sustainability principles in their design, education systems can build a resilient foundation for effectiveness and scalability to tackle the complexities ahead.

CONCLUSION

In current study, we explored some definitions of human capital development around education systems with emphasis on relationships between skills, leadership and sustainability. By performing a systematic literature review applicable to PRISMA, this paper was able to discover and analyze specific questions concerned with the topic. The findings suggest that this study has achieved its purpose, and the review offers greater understanding of how the three factors are interdependent in fortifying educational systems.

The findings indicate that the development of human capital remains a central component in creating an efficient and competitive education system. It can be a boost for personal performance, organizational excellence and the supply side of human capital due to investments in education, training and skills that anticipate technological advancement. Today more than ever, this has become a serious precondition due to digital transformation changing the approach in education & work. But more surprisingly, these results also further demonstrate the validity of human capital theory – but only in a nicer way to the need of modernity.

According to the study, there was also an over-to-hound role of leadership in play for the growth of human capital. Therefore, transformational and sustainable leadership could augment institutional motivation and innovation and adaptability. However, when it comes to performance, leadership is not always a clean correlation. Sometimes, it is also about other factors like organizational capability, learning orientation and innovation. This suggests that leadership works best when institutional systems and the learning culture support it.

Beyond that, however, sustainability is also a key component of modern education systems. It helps transform the role of education beyond simply preparing you with technical knowledge and skills through principles of sustainability, particularly using Education for Sustainable Development (ESD). It also incorporates an ethos of ethics, social and environmental responsibility. Therefore, human capital development needs to emphasize social and environmental values as well as economic productivity.

However, the major contribution of this study is the integrative view defined here. This

research combines human capital, leadership and sustainability in one discussion rather than separating them. It explains that these three elements are inter-connected, and using one for another can enhance the way education systems implemented. Besides, it is a real scope of reference for extended research in Human Development under a wider view.

When viewed in a more practical light, these findings have beginnings implications for administrators and the education system. Integrate continuous skills training, do some sharpening of leadership skills and substantiate sustainability-focused values within the core agendas of education systems and institutions on both ends. All of these initiatives are essential in developing future-ready human capital, which is also resilient and adaptable.

This study also has limitations. Results: This study is conducted based on the literature review; therefore, results are obtained from secondary data already gathered in earlier research. So many empirical methods were recommended to investigate this relationship in particular educational contexts concerning human capital, leader & sustainability and to do future studies. In future research, one can also examine the problems related to new technologies, cross-border comparisons of developing human capital and implementation promotor policies (such as market reforms).

In conclusion, the need of educational systems which must now be advocated from a wider foundation than human capital is in this study. But skills, leadership and sustainability should be viewed as fit components that can playfully reinforce each other. Building up these three dimensions will apparently help education systems overcome the challenges of the modern world and be more responsive, adaptive and sustainable.

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