_____

Holistic Employee Capability Analyzer: An Ai-Driven Framework for Optimizing Training Needs Identification in Philippine Educational Institutions

Ma. Eliza D. Mapanoo, DIT[1]

[1] *Faculty, College of Computer Studies*
University of Perpetual Help System Laguna

Abstract:- The Holistic Employee Capability Analyzer (HECA) is an AI-driven framework designed to assist the Human Resources Department (HRD) in efficiently identifying and determining appropriate training for teaching personnel by integrating data from resumes, historical training records, and feedback from student and department head evaluations. This study utilized a descriptive-correlational research design, gathering data from HR personnel and teaching staff through structured survey questionnaires administered across selected Philippine educational institutions. Findings revealed that fragmented data sources and inefficient manual processes significantly hindered HR departments during the training needs analysis process. Results also indicated a positive correlation between competencies identified through integrated data analysis and the actual training recommended or attended by teaching personnel. Consequently, the proposed HECA framework provides an improved competency assessment method, significantly enhancing HR efficiency and accuracy in precisely identifying training needs.

Keywords: AI, training need analysis, HR Department, Educational Institutions.

1. Introduction

Philippine educational institutions have been integrating Artificial Intelligence (AI) in teaching and learning processes. Aiming to compete globally Philippine government agency like Department of Education and Second Congressional Commission on Education (EDCOM 2) continuously creates environment such as Center for AI Research (E-CAIR) and training with partnership with technology leaders like Microsoft to increase effectiveness in both teaching and learning (Rodrigo & Talandron-Felipe, 2024) (DepEd, 2025) (Microsoft, 2025). Aside from aid in education settings, AI has been applied to automate administrative task, personalized leaning, and enhance assessment system despite ethical concerns and under scrutiny due to robust evidence (ASEF, 2024) (Cardona, Rodriguez, & Ishmael, 2023).

AI's integration in the field of education has been proven efficient and accurate in terms of personalized learning, virtual assistance system and task automation (PhD López-García, Campillo-Ferrer, Zaragoza-Vidal, & Miralles-Sánchez, 2020) (Lacuna, 2025) , leaving the Training Needs Assessment of Human Resource (HR) challenging in personalizing training and development among teaching personnel (Chen, 2022) (Xing, 2023) (Da-ang, et al., 2024) (Dubalan, 2023). Additionally, teaching and HR staff lack formal AI training which limit their ability to use AI tools effectively (Lacuna, 2025).Addressing these gaps is critical to optimize training processes, enhance teacher competencies and improves educational outcomes.

Training and development are complex processes with significant impact on individual and organization. The development and implementation of training needs assessment sustains organizational performance by understanding the multifaceted mechanisms needed within the organization (Da-ang, et al., 2024). AI as a core

_____

driver of industrial transformation revolutionized educational institutions with impact on personalized learning among diverse educators and learners (Xing, 2023) (ASEF, 2024).

AI is also recognized for its potential in curriculum development, lesson planning, assessment assistive lecturer, and automating administrative tasks such as validating assessment interpretation, determining students' progress, allowing educators to focus more on student engagement (Lacuna, 2025). However, integration remains difficult due to limited formal training and digital literacy among educators (Lacuna, 2025) (PhD López-García, Campillo-Ferrer, Zaragoza-Vidal, & Miralles-Sánchez, 2020). Finding equity in training access and quality on training outcomes has been a challenge among HR staff. Challenges include high technology costs, data privacy concerns and possible job displace due to inefficiencies on identifying training needed by personnel (Chen, 2022).

Given the context, this study seeks to answer (1) What is the level of competencies of teaching personnel as determined by resume content qualifications, training and workshops attended, student evaluation feedback, and department head evaluation feedback, (2) What is the current process and average time spent by HR personnel in identifying training needs for teaching staff, (3) What are the challenges encountered by HR departments in integrating data sources (resumes, trainings, evaluations) for training needs analysis, (4) Is there a significant relationship between the competencies identified through integrated data analysis and the trainings recommended or attended by teaching staff, and (5) What intelligent system model or framework can be proposed to optimize HR training needs identification and competency assessment in Philippine educational institutions?

Addressing these problems is essential to enhance organizational performance resulting to individual growth leading to a long-term organizational success (Da-ang, et al., 2024). Additionally, Lacuna (2025) and Kromp & Greenhow (2020) pointed out that accessible and structured AI training programs are critical to increasing user confidence and potential in education. Chen (2022) further emphasizes that having AI based training can revolutionize knowledge management, needs analysis, and feedback mechanisms, turning organizations into adaptive knowledge of entities. UNESCO's (2024) AI competency frameworks guide teacher training and ethical use of AI, fostering lifelong learning and professional development. Chiekezie, Obiki-Osafiele, & Agu (2024) and Dubalan (2023) believe that personalized pathways and modular training programs ensure equitable access to development opportunities, preparing educators for evolving digital demands. Upskilling and reskilling initiatives help workers adapt to AI-driven labor markets changes, supporting organizational agility and competitiveness (Pietrantoni, et al., 2023) (Rodrigo & Talandron-Felipe, 2024).

Indonesia's technology in digitalization of credentials is one of the types of evidence that AI offers wider learning opportunities and better alignment of skills and demand in labor market (Camilleri & Dr. Ardie, February 2022). AI training provided among students and teachers proves that misconceptions on motivational leaning thus found effective in developing personality and motivational growth (PhD López-García, Campillo-Ferrer, Zaragoza-Vidal, & Miralles-Sánchez, 2020). Manahan, Lacatan, & Miguel (2022) recommend cloud-based HR management systems among government institutions to have improved training management with compliance with data privacy laws. Angara (2020) propose digitalization transformation in Philippine educational institutions to prepare learners and educators for a digital future.

Training and development encompass learning activities designed to improve employee skills and knowledge focusing on long-term growth fosters motivation, productivity and loyalty to institutions (Da-ang, et al., 2024) (CHRMO, 2024) (Mgeta, 2025). AI's application in education includes learning systems, automated assessment and administrative automation requiring governance to prevent bias and ensure fairness (Akgun & Greenhow, 2022) (Cardona, Rodriguez, & Ishmael, 2023). AI in HR provides competency mapping, training organization, and feedback mechanisms which transform organizations into knowledge-driven entities (Chen, 2022). However, AI implementation cost technology cost, data privacy, job security concerns, and digital literacy gaps (Pietrantoni, et al., 2023) and demands for transparency, cultural sensitivity and adherence to legal standards (UNESCO, 2024) (Cardona, Rodriguez, & Ishmael, 2023).

With the contexts, this study aims to This study aims to develop and evaluate the **Holistic Employee Capability Analyzer**, an AI-driven framework to optimize training needs identification and competency assessment in Philippine educational institutions. Specifically, it seeks to: (1) Assess teaching personnel competencies based on

_____

resumes, qualifications, trainings, student and department head evaluations, (2) Examine current HR processes and time spent on training needs identification, (3) Identify challenges in integrating data sources for training needs analysis, (4) Determine relationships between competencies identified and trainings attended, (5) Propose an intelligent system model to optimize HR training needs identification and competency assessment.

2. Methods

The study utilized a purposive sampling technique to select participants who are directly involved in training needs analysis (TNA) process within Philippine Educational Institutions. The sample comprised two primary groups: teaching personnel and human resource (HR) staff.

A total of 42 teaching personnel from various institutions including University of Perpetual Help System Laguna, Trimex Colleges, Colegio de Muntinlupa, Angelo L. Loyola Senior High School, St. Therese School of Southville, Asiatech, San Pablo Colleges, STI College – Carmona, Cavite State University, DepEd Carmona School, Manuel S. Enverga University, GMA Technical High School (GMATHS), and Carmona National High School participated in the survey. The selection was based on their active teaching roles and willingness to provide detailed information on their competencies, training history and evaluation.

HR Personnel participated in the study came from City Government of Carmona, TA Healthcare, Concentrix, Rogationist College, Macquarie Group, DepEd – Carmona School, SML NFNIT Enterprises, Honda Cars, and St. Therese School of Southville, Inc. The respondents are chosen for their involvement in the TNA Process and their ability to provide insights into current practices, challenges and openness to intelligent systems.

The study was conducted across multiple educational institutions in the Philippines, representing both private and public sectors, encompassing higher education, senior high school, and corporate training environments. Data collection was conducted online to ensure wider reach and convenience for participants.

Two structured survey instruments were developed and validated for this study: (1) Teaching Personnel Survey, this instrument collected respondents data (resume qualification, years of teaching experience, alignment of resume qualification with teaching assignments, number of relevance certifications and trainings attended, student evaluations scores, frequency and usefulness of department head feedback, perceived competency gaps, and attitudes towards AI-driven TNA Survey. (2) HR Personnel Survey, this instrument captured information on HR staff's years of experience, institutional affiliation, methods and tools used for TNA, time spent per analysis cycle, challenges in data integration, severity of these challenges, desired system features, and concerns regarding AI adoption.

Data are collected using Google Forms. The survey links are distributed via institutional email and professional networks. Participation was voluntary, and respondents could withdraw at any time.

The survey responses were exported to Microsoft Excel and SPSS for statistical Analysis. Descriptive statistics (frequency, percentage, mean and standard deviation) were used to summarize demographic data, competency levels, training participation, evaluation score and HR practices. Cross tabulation and correlation analyses were performed to examine relationships between identified competencies and training participation, HR challenges, and openness to intelligent systems.

Open-ended responses were coded and thematically analyzed to identify recurring challenges, suggestions, and concerns regarding the adoption of AI-driven TNA systems. Triangulation was performed by comparing qualitative insights with quantitative trends to enhance validity.

Data from teaching and HR personnel were synthesized to provide a holistic view of current TNA practices, competency gaps, and system requirements. Findings directly informed the development of the proposed AI-driven framework for holistic employee capability analysis.

3. Results and Discussion

This section present the analysis of data collected from teaching and human resource personnel accross various Philippine educational institutions. Respondents demographic profile, competency levels, training participation,

_____

evaluation feedback, and the current proccesses and challeges associated with training needs assessment are explained in this section. Each table is explained to highlight key trends and relationships of AI integration and educational reform in Philippines. The discussion present statistical outcome and its connection to relevant literature which provided isights on the implications for teacher development, HR practives and the adoption of intelligent system in education HR.

3.1 Demographic Profile of Respondents

According to the respondents' profile there are 101 teaching personnel, and 39 HR personnel agreed to take part in this study.

Table 1 presents the number of teaching personnel in private and public schools. Findings show that among 101 teaching personnel surveyed, 53.5% are from private schools, and 46.5% are from public schools.

Table 1: School Type of Teaching Personnel

School Type	Frequency	Percent
Private	54	53.5
Public	47	46.5
Total	**101**	**100.0**

The results shows that there is a balanced respondent's representation which ensure a diverse range of experiences and practices across teaching level. The study conforms to Rodrigo & Talandron-Felipe (2024), DepEd (2025), Microsoft (2025) integration of AI in educational institutions.

Table 2 shows the distributions of teaching personnel respondents based on the educational levels offered by their respective institutions. 60.4% of the respondents teach in school offering "all levels", meaning this institution provides education ranging from elementary through college. Results shows that most of the respondents encounters diverse teaching and learning responsibilities, requiring a broad spectrum of competencies and training needs. 13% of respondents are associated with institutions exclusively offering college-level education, indicating a special educational setting focused mainly for higher education teaching methods. 12% of the respondents teaches both on junior and senior levels which means that there should be a unique training for pedagogical and curriculum demands. Respondents teaching exclusively in elementary comprise 5.9% while there are minimal portion that teach only in Senior High School and Junior High School.

Table 2: School Learning Level

Level	Frequency	Percent
All Level	61	60.4
College	14	13.9
Elem / JHS	1	1.0
Elem	7	5.9
JHS	3	3.0
JHS / SHS	13	12.9
SHS	2	2.0
Total	101	100.0

Table 3 presents the respondent's educational background. Findings show that Majority hold master's degrees (50.5%), followed by doctorate degrees (31.7%) and bachelor's degrees (16.8%).

_____

Table 3: Educational Background

Educational Degree	Frequency	Percent
Bachelor's Degree	17	16.8
Master's Degree	51	50.5
Doctorate Degree	32	31.7
Other	1	1.0
Total	**101**	**100**

Findings shows that the qualification aligns with the study of Da-ang, et al., (2024) highlighting the necessity of advance training and development programs to meet diverse professional needs. Also, Chen (2022) and Lacuna (2025) recommends the integration of AI driven training tools across Human Resources to tailored teaching personnel competencies.

Table 4 presents the distribution of respondents based on their teaching years' experience. 61.4% have more than 10 years of experience, 16.8% teaching for 4 – 7 years, 13.9% belongs to group of teachers with limited experience of 1 – 3 years. The smallest group is the 8-10 years of teaching experience with 5.9%.

Table 4: Years of Teaching

Number of Years Teaching	Frequency	Percent
1 – 3 years	14	13.9
4 – 7 years	17	16.8
8 – 10 years	6	5.9
More than 10 years	64	61.4
Total	**101**	**100.0**

Table 5 presents the distribution of Human Resource (HR) respondents based on respondents' affiliation. A considerable proportion of respondents came from Department of Education (DepEd), 41% indicating a strong representation from the public education sector. 28.2% of the sample came from corporate sectors where HR practices, tools resources, and training requirements highlights the difference to those who are in government agencies. Government Agency and Private Schools each have 15.54% respondents. The varied sectoral representations show the importance of HECA in accommodating diverse institutional policies, operational frameworks, budget constraints and levels of acceptance to technological environments. Findings show diverse HR backgrounds which captures the recommendations of Da-ang, et al., (2024) to capture a broad view of practicing training needs assessment (TNA) across sectors through the implementation of AI.

Table 5: Human Resource Demographic

HR Sector	Frequency	Percent
DepEd	16	41.0
Government Agency	6	15.4
Private Company	11	28.2
Private School	6	15.4
Total	**39**	**100.0**

Table 6 present the distribution of HR respondents according to years of experience working in Human Resource Role. Findings show a significant majority of 61.4% of HR respondents with more than 10+ years of experience. A small percentage (15.4%) came from 4 to 7 years of experience, a transitional respondent transforming for

_____

contemporary to technology driven practices. 12.8% represents respondents from 8 – 10 years of experience which remain adaptable to integrating new HR technologies and practices. The smaller portion came from respondent with 1 – 3 years of experience (7.7%), new to the field of HR practices, but with experience to the innovative technology like AI.

Table 6: Human Resource Demographic

Number of Years in HR	Frequency	Percent
1 – 3 years	3	7.7
4 – 7 years	6	15.4
8 – 10 years	5	12.8
More than 10 years	25	64.1
Total		

The findings show similarity with the work of Lacuna (2025) that experienced HR staff are most likely familiar with traditional TNA process but have limited technical knowledge while those who are younger ones might be technically know how but have limited knowledge on the HR practices.

3.2 Level of Competencies of Teaching Personnel

This section presents the analysis of teaching personnel competencies as determined by resume content qualifications, training workshops attended, student and dean's evaluations feedback as shown from Table 7 to 11.

Table 7: Teacher's Expertise in Teaching

Level of Competencies (Teaching	Highest Educational Qualification	Number of Years Teaching	Alignment of qualification to current teaching responsibilities
Mean	2.168	4.208	4.416
Std. Deviation	.7081	1.1774	.6522

Table 7 indicates a high level of alignment with a mean of 4.416 and SD of .6522 between teachers' educational qualification and teaching responsibilities. Findings show that respondents have qualifications directly relevant to their roles indicating strong foundational competencies. Respondent's educational degree (mean = 2.168, SD = .7081) and teaching experience (mean = 4.208, SD = 1.1774) shows capabilities and expertise in their chosen field. The findings show alignment with Chen (2022) and Da-ang et al. (2024) that teaching personnel are adaptable and flexible ready to embrace new training designed to uplift their professional backgrounds.

Table 8 reveals the relevance of training to teaching among respondent's responses. Respondents reported a high relevance with a mean of 4.257 and SD of .7570 between training and teaching responsibilities. Findings show that there is adequate training and workshops (mean = 3.267, SD = .8354), indicating initiative-taking professional development. The mean of 3.228 and SD = .8589 is also evident that teaching personnels are continuously making efforts to stay professionally updated.

Table 8: Relevance of Training to Teaching

Training and Workshop Attended and Teaching Responsibilities	Number of Certificates related to teaching	Number of Workshop Attended in past 3 years	Relevance of trainings to teaching responsibilities
Mean	3.228	3.267	4.257
Std. Deviation	.8589	.8354	.7570

_____

Findings shown in Table 8 conforms with the study of (Chiekezie, Obiki-Osafiele, & Agu, 2024) and (Lacuna, 2025) that trainings programs was significantly enhance teaching competencies and have positive influence on educational outcomes and institutional effectiveness.

A considerable proportion of teachers received positive evaluations from students, with 38.6% rated as excellent and 32.7% as Very Satisfactory. Findings show that most of the teaching personnel professional competencies perform effectively based on the perspective of the students. However, there is an alarming portion of 18.8% "not applicable" responses which may impact the comprehensiveness assessment of teacher competencies. The results shows alignment to recommendation of (PhD López-García, Campillo-Ferrer, Zaragoza-Vidal, & Miralles-Sánchez, 2020) study and report presented by (ASEF, 2024) that Training Needs Assessment needs sufficient evaluation data to tailored personalized learning among teaching force.

Table 9: Student Evaluation

Student Evaluation	Frequency	Percent
Excellent	39	38.6
Good	2	2.0
NA	19	18.8
No Idea	1	1.0
Satisfactory	7	6.9
Very Satisfactory	33	32.7
Total	**101**	**100**

Based on the respondents' responses, Dean evaluation (Table 10) was conducted once a year (41.6%) and twice a year (26.7%). This conforms to the study of Chen (2022) that regular evaluation provides critical feedback vital for teacher improvement. Additionally, Rodrigo & Talandron-Felipe (2024) believes that the implementation of RAG (retrieval augmented generation) to DepEd might result to easy identification of teacher's competencies and gap.

Table 10: Deans Evaluation

Dean's Evaluation	Frequency	Percent
More than twice a year	26	25.7
Never	6	5.9
Once a year	42	41.6
Twice a year	27	26.7
Total	**101**	**100.0**

For the usefulness of Evaluation to teaching (Table 11), result shows that department feedback (mean – 4.426) mechanism is significantly useful for teacher performance development. Student evaluation got a mean score of 3.49 while the dean's feedback got the lowest mean score of 2.72.

Table 11: Teacher's Evaluation Usefulness to Teaching

Teacher's Evaluation Usefulness to Teaching	Student's Evaluation	Dean's Feedback	Rate the usefulness of Department head feedback to improve teaching
Mean	3.49	2.72	4.426
Std. Deviation	1.863	.918	.8043

_____

Findings show that immediate supervisory feedback should be included in competency assessment frameworks as recommended by Akgun & Greenhow (2022).

3.3 Current Process and Time Spent by HR in Training needs Identification.

Presented in Table 12 are a variety of methods currently employed by HR personnel to identify training needs. The most common approach involves a combination of performance appraisals, staff surveys, employee feedback, department head recommendations, and data analytics / HRIS (human resource information system) with 23.1%. Other methods include fewer combinations of techniques such as performance appraisals combined with staff surveys, employee feedback, and department heads recommendations with 17.9%, while the remaining 15.4% goes to performance appraisals, employee feedback, and recommendations from department heads.

Table 12: Methods Used in Identifying Training Needs

Rank	Methods	N	(%)
1	Performance appraisals, Staff Survey, Employee Feedback, Department Head Recommendations, Data Analytics / HRIS	9	23.10%
2	Performance appraisals, Staff Survey, Employee Feedback, Department Head Recommendations	7	17.90%
3	Performance appraisals, Employee Feedback, Department Head Recommendations	6	15.40%
4	Department Head Recommendations, Data Analytics / HRIS	3	7.70%
4	Performance Appraisals only	3	7.70%
4	Performance Appraisals, Department Head Recommendations	3	7.70%
4	Performance Appraisals, Employee Feedback, Department Head Recommendations, Data Analytics / HRIS	3	7.70%
4	Staff survey, Employee Feedback, Data Analytics / HRIS	3	7.70%
9	Staff survey, Employee Feedback, Department Head Recommendations	2	5.10

The results presented in Table 12 reveals the multiple sources and tools used by the HR Department in identifying and determining training needs. According to Chen (2022), Lacuna (2025) and Rodrigo & Talandron-Felipe, 2024 study, problems like fragmented data, redundancies, or inconsistencies might arise from multiple resources.

Data in table 13 indicate a significant proportion of 38.5% stating that HR respondents spent more than one month identifying training needs, followed by 3-4 weeks, and 1-2 weeks having 23.1 % of repondent. Only a small portion of 15.4 reported spending less than a week.

Table 13: Time Spent in Identifying Training Needs

Average Time Spent in TN identification	Frequency	Percent
Less than a Week	6	15.4
1 - 2 Weeks	9	23.1
3 – 4 Weeks	9	23.1
More than A month	15	38.5
Total	**39**	**100.00**

HR average time spent in computing training needs got a mean score of 2.846 and SD of 1.1130, reveals that the HR personnel spend between two to four weeks identifying training needs. The average further reinforces the identified inefficiencies and time – consuming nature of current processes as presented in Table 13, validating the

_____

need for streamlined AI – driven solution, which significantly reduce the duration of identifying training needs and optimize HR efficiency.

Table 14: Average Time Spent (Frequency)

Mean	2.846
Median	3.000
Std. Deviation	1.1130

3.4 Challenges Encountered by HR in Data Integration

Table 15 highlights the significant challenges encountered by HR departments. The primary challenge identified involves combination of data silos, data inconsistencies, privacy, and security concerns, technical complexity, resistance to change, and lack of integration tools (17.9%). Another key challenge includes privacy and security concerns, technical complexity, and resistance to change with 15.4% responses.

The findings validate the barriers identified by Chen (2022) and UNESCO (2024) emphasizing data integration difficulties, privacy concerns and resistance as major barriers to effective training need analysis. The complexity of integrating multiple and fragmented data sources are critical factors on having personalized training, thus having a user friendly and secured AI driven training needs assessment can address the issues.

Table 15: Challenges encountered by HR Departments

Rank	Challenges Encountered	N	%
1	Data Silos, Data inconsistencies, Privacy and Security concerns, technical complexity, Resistance to Change, Lack Integration Tools	7	17.90%
2	Privacy and Security concerns, technical complexity, Resistance to Change	6	15.40%
3	Data Inconsistencies only	3	7.70%
3	Data inconsistencies, Privacy and Security concerns, technical complexity	3	7.70%
3	Data Silos, Data inconsistencies, technical complexity, Resistance to Change, Lack Integration Tools	3	7.70%
3	Lack of Integration Tools only	3	7.70%
3	No Challenges ("None")	3	7.70%
3	Resistance to Change, Lack Integration Tools	3	7.70%
3	Technical complexity, Lack Integration Tools	3	7.70%
3	Resistance to Change, Resistance to change, Lack Integration Tools	3	7.70%
10	Data Silos, Data Inconsistencies, Resistance to Change, Lack of Integration Tools	2	5.10%

3.5 Relationship Between Competencies and Recommended or Attended Training

Table 16 provides evidence of significant correlations between identified competencies and training attended or recommended:

Teacher resume content qualification alignment has a significant correlation with student evaluation feedback with a Pearson correlation coefficient of 0.0400 and p value of <1.01. This indicates that teachers whose qualifications align well with their current roles also tend to receive better student's evaluations, suggesting alignment of qualification with effectiveness in teaching as perceived by students.

Department head feedback and number of trainings attended has a significant correlation of $r = 0.437$ and $p < 0.01$. The findings show that teachers receiving more frequent or effective department head evaluations participate

_____

in more training sessions. The results imply that feedback mechanism positively influences teachers' professional development activities.

The Pearson r correlation = 0.124 with p value > 0.05 of resume qualification alignment to number of trainings attended have no significant correlations. The results suggest that while administrative feedback strongly motivates training participation, students' evaluation and alignment of resume qualification cannot directly predict training attendance.

Table 16: Correlation Matrix Among Resume Qualifications Alignment, Student Evaluation Feedback, Dean's Feedback, and Training Participation

		Alignment of resume qualifications to teaching responsibilities	Student Evaluation Feedback	Deans' Feedback	Number of Trainings for the past 3 years
Alignment of resume qualifications to teaching responsibilities	Pearson Correlation	1	.400**	.111	.124
	Sig. (2 Tailed)		.000	.269	.216
	N	101	101	101	101
Student Evaluation Feedback	Pearson Correlation	.400*	1	.173	.070
	Sig. (2 Tailed)	.000		.084	.486
	N	101	101	101	101
Deans' Feedback	Pearson Correlation	.111	.173	1	.437**
	Sig. (2 Tailed)	.269	.084		.000
	N	101	101	101	101
Number of Trainings for the past 3 years	Pearson Correlation	.124	.070	.437**	1
	Sig. (2 Tailed)	.216	.486	.000	
	N	101	101	101	101

The study findings strongly support the implementation of integrated, multisource analytics with AI driven system like HECA, capable of leveraging the predictive relationship as identified by diverse users.

The findings highlight existing HR practices' inefficiencies and complexity, with current methods involving fragments, redundant and time-consuming processes. The correlational analysis further validates the potential for integrated analytics to enhance targeted professional development interventions effectively.

The insights provide strong justification for the proposed HECA framework, designed explicitly to address inefficiencies. The role of optimization with secured data sources would definitely enhance not only the teachers' professional competencies but also increase HR staff work performances in Philippine Educational institutions.

3.6 Proposed Intelligence Framework

Based on the findings of the study, Holistic Employee Capability Analyzer (HECA) framework is proposed as an intelligent, AI system designed to optimize training needs identification and competency assessment within Philippine educational institutions. HECA integrates multiple data sources: resume qualifications, training and workshop records, students, evaluation, department head feedback and additional sources capable of handling both requirements mandated by government agencies with respect to personalized training needs. The holistic data approach ensures more accurate and efficient and accurate training for teacher competencies and personal development.

Key features of HECA frameworks are (1) Integrated Data Repository which addresses identified issues of fragmented data silos and inconsistencies as suggested by Manahan et al., (2022), (2) Competency Mapping Module that automatically identifies data in resume, training workshop record, student and department evaluation to accurately determine competency, (3) AI based analytics engine, which employs machine learning algorithms for predictive and descriptive analysis. This addresses inefficiencies from manual processing through quick analyzing multiple data sources such as performance appraisals, staff surveys, employee feedback, department

_____

head recommendations and any other embedded data, (4) Personalized Training Recommendation System, this delivers personalized recommendations based on identified competencies and performance evaluation data. (5) User – friendly dashboard and visualization interface which simplifies the complex technical operations at HR as identified by HR staff, (6) Compliance and data privacy module to protect data compliant to institutional regulations and build trust among users, (7) Adaptive learning components powered by continuous feedback which refines competency and training based on the data collected.
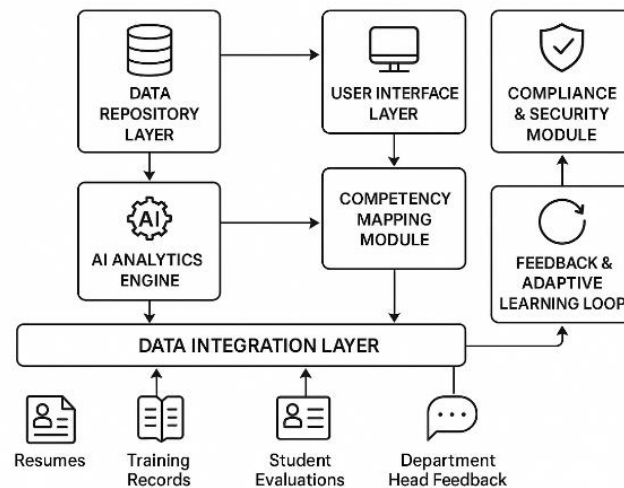

Figure 1. HECA Framework

4. Conclusion

The Holistic Employee Capability Analyzer (HECA) offers significant advancement in optimizing training needs identification and competency assessment within Philippine Educational Institutions. HECA addresses the challenges of fragmented data, inefficiencies, and limited data adoption of AI in HR practices. The positive correlations found between identified competencies and training participation validate the framework potential to enhance targeted professional development. HECA also promotes equity and equality in terms of equitable access to personalized training supporting teacher career development and institutional agility. The development of HECA complies with the trust of UNESCO (2025) and DepED (2025) in integrating AI into educational practices with respect to data protection and training needs assessment.

5. Future Directions

To determine the implications of this study, the following directions are proposed.

1. Prototype development and system validation, developed a functional prototype of the HECA framework incorporating its key modules: data integration, analytics engine and training recommender system.

2. Comparative Evaluation of TNA approaches, compared traditional TNA methods with the HECA system in terms of time spent, cost, and effectiveness in identifying competency gaps.

3. AI Algorithm enhancement, incorporate more advanced machine learning techniques such as predictive analytics and clustering to recommend targeted training modules based on grouped needs and roles.

4. Policy and Ethics Framework, collaborate with education policy makers and data privacy experts to establish AI ethical standards and data protection policies aligned with HECA operations.

Scalability and Localization designed a scalable version of HECA for implementation in other sectors like local government, healthcare, and manufacturing.

_____

References

[1] Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K12 settings. *AI and Ethics*, 431 - 451. https://doi.org/10.1007/s43681-021-00096-7

[2] Angara, S. (2020). Senate Bill No. 1470: An Act providing for a national digital transformation policy and for other purposes. Eighteenth Congress of the Republic of the Philippines, First Regular Session. Senate of the Philippines. Retrieved January 2025, from http://www.senate.gov.ph/lisdata/3262229487!.pdf

[3] ASEF. (2024). *Artificial Intelligence and Education: The Views of Teachers from Asia and Europe.* Asia-Europe Foundation (ASEF).

[4] Camilleri, A., & Dr. Ardie, S. W. (February 2022). *Digital Credential Recognition: Mapping and Identification of Digital Credit Transfer System Needs in ASEAN.* Jakarta Indonesia: Support to Higher Education in the ASEAN Region. Retrieved from www.share-asean.eu

[5] Cardona, M. A., Rodriguez, R. K., & Ishmael, K. (2023). *Artificial Intelligence and the Future of Teaching and Learning: Insights and Recommendations.* US Department of Education, USA. Retrieved from https://tech.ed.gov

[6] Chen, Z. (2022). Artificial Intelligence-Virtual Trainer: Innovative Didactics Aimed at Personalized Training Needs. *Journal of the Knowledge Economy*. doi: https://doi.org/10.1007/s13132-022-00985-0

[7] Chiekezie, N. R., Obiki-Osafiele, A. N., & Agu, E. E. (2024, August 13). Preparing the workforce for AI technologies through training and professional development for future readiness. *World Journal of Engineering and Technology Research*, 001-018. doi: https://doi.org/10.53346/wjetr.2024.3.1.0050

[8] CHRMO. (2024). Training Needs Assessment for the Year 2024. San Jose City, Nueva Ecija, Philippines.

[9] Da-ang, J., Queja, D. M., Sendin, T. M., Tottoc, A. A., Villanueva, C. M., & Mania, J. R. (2024). Assessing the Perceived Benefits of Training and Development on Employee Performance in Municipal Financial Management Offices: A Case Study of Solano's Local Government Unit. *INTERNATIONAL JOURNAL OF RESEARCH AND INNOVATION IN SOCIAL SCIENCE (IJRISS)*. doi: DOI: 10.47772

[10] DepEd. (2025, 25 February). *DepEd launches AI center for education*. Retrieved from Department of Education: https://www.deped.gov.ph/2025/02/20/deped-launches-ai-center-for-education/

[11] Dubalan, J.-a. M. (2023, May 25). TRAINING NEEDS ASSESSMENT OF PUBLIC SCHOOL TEACHERS IN MALAPATAN 1 DISTRICT TOWARDS A PROPOSED INTERVENTION PROGRAM IN ADDRESSING THE PHILIPPINE PROFESSIONAL STANDARDS FOR TEACHERS. *International Journal of Novel Research in Education and Learning*. doi: DOI: https://doi.org/10.5281/zenodo.7970729

[12] Kromp, M., & Greenhow, C. (2020). Designing professional development for teachers in the age of AI: Key considerations and strategies. *International Journal of Educational Technology*, 30-45.

[13] Lacuna, J. R. (2025). Exploring the Readiness of Pre-Service Teachers for AI Integration in Philippine Education. *INTERNATIONAL JOURNAL OF RESEARCH AND INNOVATION IN SOCIAL SCIENCE (IJRISS)*, 4907 - 4924.

[14] Manahan, J. P., Lacatan, L. L., & Miguel, A. R. (2022). Implementation of PRIME-HRM Program Using Cloud Based Technology. *Technium*.

[15] Mgeta, M. P. (2025). The Influence of Training Program on Employee Performance at Telecommunications Company Limited. *INTERNATIONAL JOURNAL OF RESEARCH AND INNOVATION IN SOCIAL SCIENCE (IJRISS)*, 382-399. doi: DOI: 10.47772/IJRISS

[16] Microsoft. (2025, February 26). *DepEd and Microsoft Drive AI Adoption in Philippine Education*. Retrieved from Microsoft Source Asia: https://news.microsoft.com/source/asia/2025/02/26/deped-and-microsoft-drive-ai-adoption-in-philippine-education/

[17] PhD López-García, A., Campillo-Ferrer, J., Zaragoza-Vidal, M., & Miralles-Sánchez, P. (2020). Analysis of an Artificial Intelligence Training Program in University Students: Perspective and Horizons. *DICSO Research Group of University of Murcia*, 31 - 51. doi: https://doi.org/10.36006/09643-1-02

[18] Pietrantoni, L., Morandini, S., Fraboni, F., De Angelis, M., Puzzo, G., & Guisino, D. (2023). THE IMPACT OF ARTIFICIAL INTELLIGENCE ON WORKERS' SKILLS: UPSKILLING AND RESKILLING IN ORGANISATIONS. *Informing Sciencce: The Internatioal Journal of an Emerging Transdicipline*, 39-68. doi: https://doi.org/10.28945/5078

_____

[19] Rodrigo, M. M., & Talandron-Felipe, M. M. (2024). *Using Artificial Intelligence to Support Basic Education Teachers in Under-resourced Contexts.* University of the Philippines CIDS. Quezon City 1101: UP Center for Integrative and Development Studies.

[20] UNESCO. (2024). *AI Competency Framework for Teachers.* Education 2030. doi: https://doi.org/10.54675/ZJTE2084

[21] Xing, C. (2023). Research on the Application of Artificial Intelligence Empowered Education Management. *Journal of Artificial Intelligence Practice*. doi: DOI: 10.23977/jaip.2023.060602