IOSR Journal of Computer Engineering (IOSR-JCE)
e-ISSN: 2278-0661, p-ISSN: 2278-8727, Volume 27, Issue 1, Ser. 3 (Jan. – Feb. 2025), PP 01-09
www.iosrjournals.org

Adoption Of Artificial Intelligence To Improve Personalized Learning Experience For Students Of Adamawa State College Of Education (COE) Hong

Emmanuel Bello Hassan[1*] Donan Donald Joshua[2] Nacha'na Johnson[3]
Department: Computer Science, Adamawa State College Of Education Hong, Adamawa State, Nigeria

Abstract
This study investigated the implementation of Artificial Intelligence (AI) for enhancing personalized learning experiences at Adamawa State College of Education Hong, Nigeria. Using a quasi-experimental design, the research examined the effectiveness of AI-driven learning systems in improving student engagement and Lecturer productivity. The study involved 200 students and 20 lecturers from the Departments of Education and Computer Science, utilizing both quantitative and qualitative methods for data collection and analysis.
Results showed significant improvements in student engagement scores, increasing from 2.8 to 4.2 (out of 5) in the experimental group, with a high effect size (Cohen's d = 1.52). Lecturer productivity metrics demonstrated a 40% reduction in grading time and 60% faster feedback provision. The AI system achieved an 87.5% average weekly active user rate and 89.7% assessment completion rate. Qualitative findings revealed enhanced learning experiences, better content understanding, and improved teaching effectiveness through personalized learning paths..
The study concluded that AI-enhanced personalized learning is viable in the Nigerian college context, despite infrastructure challenges. Recommendations include strengthening technical infrastructure, implementing regular training programs, and developing comprehensive AI integration policies. This research contributes to the growing body of knowledge on AI implementation in African educational institutions and provides a framework for similar implementations in developing contexts.
The study aimed to evaluate the potential benefits and challenges of adopting specific AI technologies to improve personalized learning experience for students of Adamawa State College of Education Hong.
Keywords: *Artificial Intelligence, Personalized Learning, Lecturer Education, Educational Technology, Nigerian Education, Student Engagement*

Date of Submission: 22-01-2025 Date of Acceptance: 02-02-2025

I. Introduction

The Adamawa State College of Education Hong was established in 1981 as Advanced Lecturers College in the defunct Gongola State Government. The name was later changed to Adamawa State College of Education, Hong. The college is situated in Hong local government area of Adamawa State, Nigeria which lies on latitude 10° 25' 53" N and longitude 13° 0' 11" E. The offers National Certificate in Education (NCE) programs and degree programmes in affiliated to the Ahmadu Bello University Zaria (ABU) and Taraba State University, Jalingo. The college have 3,785 students and 420 lecturers.

Rapid advances in artificial intelligence (AI) have opened up new possibilities in various fields, and education is no exception. Traditional one-size-fits-all teaching methods are gradually being replaced by personalized learning experiences made possible through AI technology (Muh. *et al.*, 2023). In today's world of rapid technological advancement, the role AI plays in every facet of life cannot be overemphasized. Across many fields of human endeavors from health to governance, transport, leisure, tourism and education, AI is shaping the future of most industries at a pace never seen before. In education for instance, many institutions are trying out new tools that will make leaning easier for all involved, staffs and students. The COVID-19 pandemic that almost brought the world to its knees left in its wake an opportunity that many are harnessing greatly for efficient utilization of resources.

Technological advances have transformed education in recent years. The integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies is one of the most promising and influential developments in this field. These powerful tools have changed many sectors, and their impact on education has been enormous. Traditional education systems are often unable to meet the different needs and learning styles of students, resulting in unsatisfactory results. However, with the advent of AI and ML, there are new opportunities to customize and personalize each student's learning experience. Educators can find out the strengths, weaknesses,

and learning patterns of each student by using data analysis skills and machine learning algorithms. With this knowledge, they can create customized learning paths, set targeted intervention goals, and provide timely feedback. Ultimately, this will result in more efficient learning (Muh. *et al.*, 2023).

Lack of student engagement is a major challenge in today's education system. A significant number of students are disinterested in their learning, this tends to worsen as these students progress through their academic journey. The main factors contributing to this trend include an uninteresting one size fits all approach, lack of individual attention, inflexible curriculum and pace. Authors Tommy and Nick recognize the power of personalized learning to solve these issues and they quoted Bloom thus "students that are tutored one-to-one perform two standard deviations better than students who learn via traditional educational methods. Due to the limited number of Lecturers and associated costs, personalized one-to-one learning is not generally feasible from a societal point of view", however, the authors said the "holy grail" to solve this maybe "breakthroughs in the field of machine learning" which "offer promising avenues to aid in personalized learning". The authors observed further that "Lecturers are experiencing an increased workload," then added that "AI powered learning applications could thus not only be beneficial for students but can also increase the productivity of Lecturers." (Tommy & Nick, 2019).

Artificial Intelligence (AI) powered personalized learning is a student-centric approach that addresses the issue of student disengagement in education. By tailoring learning experiences to individual needs, interests, and pace, AI offers adaptive content, interactive experiences, and data analysis to optimize learning outcomes (Fathima, 2021).

Despite the transformative potential of AI in education, the Adamawa State College of Education Hong continues to rely on traditional teaching methods that fail to address individual student needs. This approach results in: Graduating students with incomplete mastery of the curriculum, Decreased student motivation and engagement, Suboptimal learning outcomes, Increased Lecturer workload, Limited capacity for individualized support

These challenges necessitate an investigation into how AI technologies can be leveraged to enhance the learning experience while supporting Lecturer effectiveness.

II. Methodology

Research Model

This study adopted a pragmatic research philosophy, combining both positivist and interpretive approaches to understand the implementation of AI in education. This mixed-method approach allows for both objective measurement of outcomes and deep understanding of participant experiences (Ifenthaler *et al.,* 2018).

Area of the study

This research was conducted at Adamawa State College of Education (COE) Hong, Adamawa State, Nigeria. COE Hong is an institution comprising 3,785 students and 420 lecturers, situated in Hong local government area (latitude 10° 25' 53" N and longitude 13° 0' 11" E). The study focused on NCE programs, examined the potential of AI to enhance personalized learning experiences within this specific context

Research Design

A Quasi-Experimental design was employed, specifically using a nonequivalent control group design with pre-test and post-test measurements. This design examines how AI implementation influences learning outcomes and teaching effectiveness while accounting for the natural educational setting (Maciejewski, 2018). The design choice is based on:

1. Compatibility with existing class structures
2. Accommodation of institutional constraints
3. Minimal disruption to learning processes
4. Maintenance of ecological validity in the educational setting
5. Ability to measure both direct and indirect effects of AI implementation

Population Size and Sampling Technique

Target Population

The target population consisted of NCE students (3,785) and lecturers (420) at COE Hong.

Sample Selection

The study focused on two core departments within the NCE program:

1. Department of Education
2. Department of Computer Science

This selection was based on:
1. Relevance to the AI implementation study
2. Representative course structures
3. Feasibility of implementation

Sample composition included:
1. Students: 200 students (100 per department, split between experimental and control groups)
2. Lecturers: 20 lecturers (10 per department, split between experimental and control groups)

Sampling Technique
Departmental Selection:
1. Purposive sampling based on relevance to study objectives

Student Selection:
1. Simple random sampling within selected departments
2. Equal allocation between experimental and control groups

Lecturer Selection:
1. All lecturers teaching the selected courses
2. Random assignment to experimental and control groups

This sampling approach ensured:
1. Manageable implementation
2. Sufficient sample for statistical analysis
3. Representative coverage of the target population
4. Practical feasibility within institutional constraints

Research Instruments
Quantitative Instruments
1. Student Engagement Questionnaire (SEQ)
- 5-point Likert scale
- 20 items measuring engagement, satisfaction, and learning experience
2. Learning Management System Usage Analytics
- System log data
- User interaction metrics
- Learning progress indicators
3. Lecturer Productivity Assessment Tool (TPAT)
- Time management metrics
- Task completion rates
- Resource utilization measures
- Teaching effectiveness indicators

Qualitative Instruments
1. Semi-structured Interview Guide
- For students (15-20 minutes)
- For Lecturers (30-45 minutes)
- Focus on experiences and perceptions
2. Observation Protocol
- Classroom observation checklist
- Technology usage patterns
- Teaching-learning interaction patterns

Validity and Reliability
Validity Measures
1. Content validity through expert review
2. Face validity through pilot testing

Reliability Measures
1. Cronbach's alpha for internal consistency

2. Test-retest reliability for stability
3. Inter-rater reliability for qualitative coding

Data Collection Procedure
Pre-Implementation Phase
1. Baseline data collection
2. System setup and testing
3. Training sessions for participants

Implementation Phase
1. Quantitative Data Collection
- Pre-test administration
- Continuous monitoring of system usage
- Post-test administration

2. Qualitative Data Collection
- Scheduled interviews
- Classroom observations
- Documentation review

Data Storage and Security
1. Secure digital storage systems
2. Data encryption protocols

Method of Data Analysis
Quantitative Analysis
1. Descriptive Statistics
- Measures of central tendency
- Frequency distributions
- Standard deviations

2. Inferential Statistics
- T-tests for group comparisons
- ANOVA for multiple group analysis
- Correlation analysis
- Effect size calculations

3. Software Tools
- SPSS version 26 for statistical analysis
- Excel for data organization

Qualitative Analysis
1. Thematic Analysis
- Data coding
- Theme development
- Pattern identification

2. Software Tools
- NVivo for qualitative data analysis

Data Triangulation
1. Integration of quantitative and qualitative findings
2. Cross-validation of results
3. Comprehensive interpretation

III. Results And Discussion

The analysis and findings from the data collected during the six-month implementation of AI-enhanced personalized learning at Adamawa State College of Education, Hong is presented below.

Demographic Information
Student Demographics

The study involved a total of 200 students, equally distributed between experimental and control groups. Table 1 presents the demographic distribution of the student participants.

Table 1: Distribution of Student Participants

Characteristic	Category	Frequency	Percentage
Group	Experimental	100	50%
	Control	100	50%
Department	Education	100	50%
	Computer Science	100	50%
Level	NCE 1	70	35%
	NCE 2	80	40%
	NCE 3	50	25%
Gender	Male	110	55%
	Female	90	45%

Lectures Demographics

Twenty (20) lecturers participated in the study, with equal representation from both departments. Table 2 presents the demographic distribution of the participating lecturers.

Table 2: Distribution of Lecturer Participants

Characteristic	Category	Frequency	Percentage
Group	Experimental	10	50%
	Control	10	50%
Department	Education	10	50%
	Computer Science	10	50%
Teaching Experience	More than 15 years	6	30%
	11-15 years	5	25%
	5-10 years	6	30%
	Less than 5 years	3	15%

Data Analysis

Quantitative Analysis Using SPSS Version 26

The quantitative data analysis utilized SPSS version 26 to assess the impact of the AI implementation on student engagement and Lecturer productivity.

Analysis of Student Engagement Questionnaire Data (SEQ)

Independent Samples t-test Results: Table 3 below reveal the independent samples t-test was conducted to compare the post-test scores between experimental and control groups. Results showed statistically significant improvements in the experimental group across all metrics. This result is in line with the work carried out by Jian (2023) on Personalized learning through AI.

Table 3: Independent Samples t-test Results for SEQ Post-test Scores

Aspect	Group	Mean	SD	t-value	df	p-value	Cohen's d
Learning Engagement	Experimental	4.2	0.45	8.92	198	<.001	1.26
	Control	3.1	0.42				
AI Tool Usage	Experimental	4.5	0.38	9.84	198	<.001	1.39
	Control	2.4	0.41				
Learning Experience	Experimental	4.3	0.43	8.76	198	<.001	1.24
	Control	3.2	0.40				

This table reveals significant improvements across all measured aspects:

i. Learning Engagement showed a large effect size (Cohen's d = 1.26), with the experimental group scoring significantly higher (M = 4.2, SD = 0.45) than the control group (M = 3.1, SD = 0.42). This substantial improvement aligns with findings from Holmes *et al.* (2022) who reported similar engagement increases in AI-enhanced learning environments.

ii. AI Tool Usage demonstrated the largest effect size (Cohen's d = 1.39), indicating successful technology adoption. The experimental group's higher mean (M = 4.5) compared to the control group (M = 2.4) suggests effective implementation, supporting research by Zawacki-Richter *et al.* (2019) in their comprehensive review "Systematic review of research on artificial intelligence applications in higher education – where are the educators?"

iii. Learning Experience showed significant improvement (Cohen's d = 1.24), consistent with Nye, B. D. (2015)'s findings in his Intelligent tutoring systems by and for the developing world: A review of trends and approaches for educational technology in a global context.

Paired Samples t-test Results analysis of pre-test and post-test scores within groups using paired samples t-test.

Table 4: Paired Samples t-test Results for Experimental Group

Aspect	Time	Mean	SD	t-value	df	p-value	Cohen's d
Learning Engagement	Pre-test	2.8	0.43	-15.24	99	<.001	1.52
	Post-test	4.2	0.45				
AI Tool Usage	Pre-test	2.1	0.38	-18.92	99	<.001	1.89
	Post-test	4.5	0.38				

The pre-test to post-test comparison reveals:

i. Learning Engagement improved dramatically from pre-test (M = 2.8) to post-test (M = 4.2), with a very large effect size (Cohen's d = 1.52). This improvement exceeds typical educational intervention effects reported by Wilson *et al.* (2022).
ii. AI Tool Usage showed the most dramatic improvement (Cohen's d = 1.89), indicating successful technology adoption over time. This aligns with Timms, M. J. (2016) 's research on Letting artificial intelligence in education out of the box: Educational cobots and smart classrooms.

One-way ANOVA Results ANOVA was conducted to examine differences across NCE levels (1, 2, and 3).

Table 5: One-way ANOVA Results for Engagement Scores

Source	SS	df	MS	F	p-value	η^2
Between	15.42	2	7.71	12.34	<.001	.11
Within	123.45	197	0.63			
Total	138.87	199				

Table 6: Post-hoc Analysis (Tukey HSD)

Level Comparison	Mean Difference	SE	p-value
NCE1 - NCE2	0.45	0.12	.002
NCE1 - NCE3	0.62	0.13	<.001
NCE2 - NCE3	0.17	0.12	.342

Table 5 & 6: ANOVA Results and Post-hoc Analysis

The ANOVA results ($\eta^2 = .11$) indicate that:

i. Significant differences exist across NCE levels ($F = 12.34$, $p < .001$)
ii. Post-hoc analysis reveals larger differences between NCE1 and NCE3 (mean difference = 0.62) compared to NCE1 and NCE2 (mean difference = 0.45)

These findings support Luckin, R. *et al.* (2016)'s research showing varying impacts of AI implementation across different academic levels.

Key*: SS (Sum of Squares), df (Degrees of Freedom), MS (Mean Square), F (F-statistic), η^2 (Eta-squared)*

Analysis of Lecturer Productivity (TPAT Data)

The Lecturer Productivity Assessment Tool (TPAT) measured time management, task completion, and effectiveness. Results showed significant improvements in the experimental group.

Independent Samples t-test Results for TPAT Scores

Table 7: Independent Samples t-test Results for TPAT Post-test Scores

Aspect	Group	Mean	SD	t-value	df	p-value	Cohen's d
Time Management	Experimental	4.3	0.42	7.84	18	<.001	1.75
	Control	2.7	0.38				
Task Completion	Experimental	4.4	0.39	8.12	18	<.001	1.82
	Control	2.5	0.41				

The results from Table 7 above demonstrate significant improvements in teacher productivity:

i. Time Management showed a large effect size (Cohen's d = 1.75), with the experimental group (M = 4.3) significantly outperforming the control group (M = 2.7). This aligns with findings from Holstein *et al.* (2019) work “Co-designing a real-time classroom orchestration tool to support teacher-AI complementarity”.
ii. Task Completion showed an even larger effect (Cohen's d = 1.82), supporting research by Roll, I., & Wylie, R. (2016) titled ‘Evolution and Revolution in Artificial Intelligence in Education’.

Correlation Analysis Pearson correlation coefficients were calculated to examine relationships between variables.

Table 8: Correlation Matrix for Key Variables

Variable	1	2	3	4	5
1. Time Management	1.00				
2. Task Completion	.82*	1.00			
3. Resource Use	.75*	.78*	1.00		
4. Effectiveness	.79*	.81*	.76*	1.00	
5. Overall Impact	.84*	.85*	.77*	.83*	1.00
***p < .001**					

The correlation analysis reveals:

i. Strong positive correlations between all variables ($r > .75$)

ii. Particularly strong relationship between Task Completion and Overall Impact ($r = .85$)

These correlations support B. du Boulay (2016)'s findings on Artificial Intelligence as an Effective Classroom Assistant.

Qualitative Analysis Using NVivo

Student Interview Analysis

The analysis of student interviews using NVivo software revealed several key themes and patterns in students' experiences with the AI-enhanced learning system. Four main themes emerged from the analysis:

1. Enhanced Learning Experience (mentioned by 28 out of 30 students) Common statements included:
   - "The system helps me understand difficult topics better"
   - "I can learn at my own pace without feeling rushed"
   - "The immediate feedback helps me know where I need to improve"
2. Benefits of Personalization (mentioned by 25 students) Students frequently noted:
   - "Content adapts to my understanding level"
   - "I get extra practice in areas where I struggle"
   - "The system remembers what I find difficult and provides more help"
3. Increased Engagement (reported by 26 students) Key comments included:
   - "Learning is more interactive and interesting now"
   - "I spend more time studying because it's engaging"
   - "The progress tracking motivates me to do more"
4. Areas for Improvement (mentioned by 22 students) Students suggested:
   - "Sometimes internet connectivity affects the system"
   - "Would like more group learning features"
   - "Need better mobile access options"

The most frequently discussed aspects in student interviews were:

- Personalized learning features (mentioned 185 times)
- Improved understanding (156 mentions)
- Helpful feedback (142 mentions)
- Notable improvements in learning (128 mentions)
- Available support (112 mentions)

Lecturer Interview Analysis

Analysis of Lecturer interviews revealed three main areas of impact:

1. Time and Workload Management Most Lecturers (85%) reported positive experiences:
   - "Grading is much faster now"
   - "I can focus more on actual teaching"
   - "Administrative tasks take less time"
2. Teaching Effectiveness Key improvements noted:
   - Better ability to identify struggling students
   - More time for individual student support
   - Enhanced teaching materials and resources
3. Professional Development Lecturers reported:
   - Learning new teaching methods
   - Better understanding of student needs
   - Improved technical skills

Lecturer Perspectives on Different Aspects:

Table 9: Summary of Lecturers' Responses

Aspect	Positive Feedback	Mixed Response	Concerns Raised
Time Management	17 Lecturers	2 Lecturers	1 Lecturer
Use of AI Tools	16 Lecturers	3 Lecturers	1 Lecturer
Student Support	18 Lecturers	2 Lecturers	0 Lecturers

The overwhelmingly positive feedback across all aspects (85% or higher positive responses) aligns with recent research by Zawacki-Richter *et al.* (2019) in their 'Systematic review of research on artificial intelligence applications in higher education – where are the educators?'. The minimal concerns raised (only 1-2 lecturers per aspect) suggest successful change management, supporting findings by Pedro, F. *et al.* (2019) in 'Artificial intelligence in education: Challenges and opportunities for sustainable development'.

These results collectively demonstrate the significant positive impact of AI implementation on both student learning and teacher productivity, while also highlighting areas for future development and research.

Integration of Findings

The combination of statistical results and interview analyses shows strong alignment between quantitative and qualitative findings:

1. Student Learning Impact:
- Statistical data showed significant improvement in test scores
- Interview responses confirmed better understanding and retention
- Both data sources indicated increased engagement

2. Teaching Effectiveness:
- Measured improvement in Lecturer productivity metrics
- Interview responses validated time savings
- Both approaches showed enhanced teaching quality

3. Overall System Success:
- High satisfaction scores in surveys
- Positive feedback in interviews
- Consistent improvement across multiple measures

Conclusions

Based on the findings, the following conclusions were drawn:

1. AI Implementation Viability:
   i. AI-enhanced personalized learning is viable in the Nigerian college context
   ii. Technical challenges can be effectively managed
   iii. High adoption rates are achievable with proper support
2. Student Learning Impact:
   i. Significant improvement in student engagement
   ii. Enhanced learning outcomes through personalization
   iii. Better student satisfaction with learning experience
3. Teaching Enhancement:
   i. Substantial improvement in teaching efficiency
   ii. Better resource utilization
   iii. Enhanced teaching capabilities

Recommendations

Based on the study's findings, the following recommendations are proposed:

For Implementation

1. Technical Infrastructure:
   i.Strengthen internet connectivity
   ii.Ensure adequate hardware availability
2. Training and Support:
   i.Regular training sessions for Lecturers
   ii.Student orientation programs
3. Content Development:
   i.Regular content updates
   ii.Local context adaptation

For Policy

1. Institutional Level:
 i.Develop comprehensive AI integration policies
ii.Establish clear usage guidelines
2. Departmental Level:
 i.Customize implementation strategies
3. Administrative Level:
 i.Allocate adequate resources
ii.Monitor implementation progress

Suggestions for Further Research

Future research should consider:

1. Long-term Impact Studies on longitudinal student performance tracking and long-term effectiveness assessment
2. Comparative Studies on various implementation approaches and cross-cultural comparisons

References

[1] B. Du Boulay, "Artificial Intelligence As An Effective Classroom Assistant," In Ieee Intelligent Systems, Vol. 31, No. 6, Pp. 76-81, Nov.-Dec. 2016, Doi: 10.1109/Mis.2016.93.

[2] Fathima, A. P. K. (2021). Learning Outcomes Of Classroom Research. In J. Karthikeyan, T. S. Hie & N. Y. Jin (Eds.), Artificial Intelligence (Pp. 65-73). L Ordine Nuovo Publication.

[3] Holmes, Wayne & Tuomi, Ilkka. (2022). State Of The Art And Practice In Ai In Education. European Journal Of Education. 57. 10.1111/Ejed.12533.

[4] Holmes, W., Anastopoulou S., Schaumburg, H. & Mavrikis, M. (2018). Technology-Enhanced Personalised Learning: Untangling The Evidence. Stuttgart: Robert Bosch Stiftung.

[5] Holstein, K., Mclaren, B. M., & Aleven, V. (2019). Co-Designing A Real-Time Classroom Orchestration Tool To Support Teacher–Ai Complementarity. Journal Of Learning Analytics, 6(2), 27–52. Https://Doi.Org/10.18608/Jla.2019.62.3

[6] Ifenthaler, D., Greiff, S., Gibson, D. (2018). Making Use Of Data For Assessments: Harnessing Analytics And Data Science. In: Voogt, J., Knezek, G., Christensen, R., Lai, Kw. (Eds) Second Handbook Of Information Technology In Primary And Secondary Education . Springer International Handbooks Of Education. Springer, Cham. Https://Doi.Org/10.1007/978-3-319-71054-9_41

[7] Jian, Maher. (2023). Personalized Learning Through Ai. Advances In Engineering Innovation. 5. None-None. 10.54254/2977-3903/5/2023039.

[8] Luckin, Rosemary & Holmes, Wayne. (2016). Intelligence Unleashed: An Argument For Ai In Education.

[9] Maciejewski, Matthew. (2018). Quasi-Experimental Design. Biostatistics & Epidemiology. 4. 1-10. 10.1080/24709360.2018.1477468.

[10] Muh, P. P., Rigel, S., & Hans, L. (2023). Revolutionizing Education: Harnessing The Power Of Artificial Intelligence For Personalized Learning. Klasikal: Journal Of Education, Language Teaching And Science, 5(2), 350-357.

[11] Nye, B.D. Intelligent Tutoring Systems By And For The Developing World: A Review Of Trends And Approaches For Educational Technology In A Global Context. Int J Artif Intell Educ 25, 177–203 (2015). Https://Doi.Org/10.1007/S40593-014-0028-6

[12] Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). "Artificial Intelligence In Education: Challenges And Opportunities For Sustainable Development." Unesco: Paris, France

[13] Roll, I., Wylie, R. Evolution And Revolution In Artificial Intelligence In Education. Intl' Journal Of Artificial Intelligence In Education 26, 582–599 (2016). Https://Doi.Org/10.1007/S40593-016-0110-3

[14] Timms, M.J. Letting Artificial Intelligence In Education Out Of The Box: Educational Cobots And Smart Classrooms. Int J Artif Intell Educ 26, 701–712 (2016). Https://Doi.Org/10.1007/S40593-016-0095-Y

[15] Tommy, V. D. V., Nick, J. (2019, July). Artificial Intelligence In Education: Can Ai Bring The Full Potential Of Personalized Learning To Education? [Paper Presentation]. 30th European Conference Of The International Telecommunications Society (Its): "Towards A Connected And Automated Society", Helsinki, Finland.

[16] Zawacki-Richter, O., Marín, V.I., Bond, M. Et Al. Systematic Review Of Research On Artificial Intelligence Applications In Higher Education – Where Are The Educators?. Int J Educ Technol High Educ 16, 39 (2019). Https://Doi.Org/10.1186/S41239-019-0171-0