

## **Integration of Natural and Artificial Laboratories to Strengthen Language Competence Based on Current Learning Issues**

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**Abstract :** *This study aims to examine the integration of natural and artificial laboratories as a strategy for strengthening language competencies in accordance with the demands of modern learning. Through library research and content analysis methods, the study reviewed literature on the characteristics and models of integration of the two laboratories. The results of the study indicate that in the context of Arabic language learning in Islamic boarding schools, natural laboratories play a role in providing contextual learning experiences through authentic environments such as dormitories, mosques, and students' daily activities, while artificial laboratories provide structured learning through technology-based simulations. Although its implementation still faces limitations in facilities and educator competence, this approach has strong potential to be developed as an Arabic language learning strategy that is relevant to the demands of today's learning in Islamic boarding schools.*

**Abstrak:** *Penelitian ini bertujuan untuk mengkaji integrasi laboratorium alam dan laboratorium buatan sebagai strategi penguatan kompetensi bahasa sesuai tuntutan pembelajaran modern. Melalui metode library research dan analisis konten, penelitian menelaah literatur mengenai karakteristik dan model integrasi kedua laboratorium. Hasil penelitian menunjukkan bahwa dalam konteks pembelajaran bahasa Arab di pesantren, laboratorium alam berperan menyediakan pengalaman belajar kontekstual melalui lingkungan autentik seperti asrama, masjid, dan aktivitas keseharian santri, sementara laboratorium buatan menghadirkan pembelajaran terstruktur melalui simulasi berbasis teknologi. Meskipun implementasinya masih menghadapi keterbatasan fasilitas dan kompetensi pendidik, pendekatan ini memiliki potensi kuat untuk dikembangkan sebagai strategi pembelajaran bahasa Arab yang relevan dengan tuntutan pembelajaran masa kini di pesantren.*

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**Keywords:** *Natural and Artificial Laboratories, Language competence, Contemporary learning*

### **INTRODUCTION**

Learning Language is a fundamental process in life man Because Language functioning as tool main For communicate , interact , and build understanding social and cultural . In context education , learning Language No only aim develop ability understand and convey ideas , but also instill awareness to values , culture and traditions attached to language said . Therefore that , understanding to draft basics and strategies learning Language become crucial for educator in designing effective and meaningful learning (Saleh, 2024) .

In context learning Arabic , challenges learning in the contemporary era the more complex along with demands learning 21st century which emphasizes strengthening competence communicative , learning contextual , as well as utilization digital technology . In the environment Islamic boarding school , learning Arabic has characteristics typical Because supported by culture , activities daily life and environment potential socio - religious as vehicle practice speaking in a way natural . However , learning Arabic in Islamic boarding schools Still often fragmented between formal learning in class and practice speaking in life everyday , so that competence speaking students Not yet develop optimally , especially in skills communication active ( Salsabila et al., 2025).

Urgency problem main in learning Arabic in Islamic boarding schools located in yet awakening integration between experience speaking natural and learning structured based technology . Approach learning that only emphasize memorization rules or use technology in a way partial Not yet capable answer need authentic , adaptive , and sustainable learning . As a result , students often own knowledge Arabic in general theoretical , but not enough skilled in use it in a way communicative in situation real . Condition This become the more problematic in the middle issue learning latest demands strengthening digital literacy , learning active , and readiness communication in space more social wide ( Mahbubi et al., 2025; Ziaul Haq et al., 2024).

As solutions , articles This offer approach integration laboratory nature and laboratory artificial in learning Arabic in Islamic boarding schools . Laboratory nature , including dormitories, mosques, activities worship , interaction social students and culture Islamic boarding school . positioned as room practice authentic and contextual language . While that , laboratory artificial based digital technology works as means learning structured through audiovisual media, simulation communication , as well as modeling Language from speaker original . Integration second laboratory This believed capable bridge gap between theory and practice speaking , as well as create learning more Arabic holistic , flexible , and relevant with need today's santri ( Mahbubi et al., 2025).

Various study in five years final show that laboratory artificial effective in increase skills listening and speaking through utilization digital technology and learning media interactive . However , the effectiveness the Still face constraint in the form of limitations readiness educators and the lack of integration with context social use language (Ziaul Haq et al., 2024). On the side other research about environment speaking experience confirm that practice Language based environment Islamic boarding school influential positive to skills speaking and trust self students ( Harnika et al., 2025). Although thus , some big study the Still study second approach in a way separate and not yet integrate it in One framework systematic learning .

Based on the literature map mentioned , there are gap research gap in the form of lack of studies that are comprehensive discuss integration model laboratory nature and laboratory artificial in learning

Arabic in Islamic boarding schools as response to issue learning latest . Therefore that , article This aim For study in a way conceptual characteristics , potential , and direction development integration second type laboratory the as strategy strengthening competence Arabic ( Salsabila et al., 2025).

Hope from article This is give contribution theoretical in the form of framework conceptual integration laboratory natural and artificial that can enrich study learning Arabic , as well as contribution practical for educators and managers Islamic boarding school in designing learning contextual , innovative , and sustainable Arabic . With thus , the article This expected can become references beginning for development of learning models adaptive Arabic to dynamics education and challenges communication in the modern era.

## METHOD

Study . This use method *library research* with approach qualitative-descriptive For study draft integration laboratory nature and laboratory artificial in learning Arabic in Islamic boarding schools , especially in respond issue learning contemporary approach This chosen Because study focused on review conceptual and synthetic idea from various source relevant literature , not field data collection . Study carried out with examine literature that is direct related with learning Arabic , environment speaking Islamic boarding school , laboratory language , as well as innovation learning based technology .

Research data sources originate from the same literature with the one used in the section introduction , so that there is consistency between background behind problems and methods research . Literature analyzed consists of on eight article journal national and international publications in range 2020–2025 , two book academics that discuss theory learning language and innovation learning contemporary Arabic , as well as One article review library about integration technology in learning Arabic . Sources the obtained through scientific databases such as Google Scholar, journal portals national accredited , and repositories journal open , with criteria election covering relevance topic , relevance with context Islamic boarding schools , focus on issues learning latest , and availability text complete .

Instrument study in the form of sheet data recording used For organize information from every source library in a way systematic . Data recording is carried out based on indicators that include focus study research , context learning Arabic in Islamic boarding schools , concept laboratory nature , concept laboratory artificial , form the integration offered , as well as his contribution to strengthening competence Arabic . Sheet recording This help researchers guard consistency analysis and avoidance unauthorized data entry relevant .

Data analysis was performed with technique analysis content through a number of mutually exclusive stages continuous . Stage First is data reduction , namely selecting and filtering information important from every relevant literature with focus integration laboratory natural and artificial . Stage next is data categorization , namely grouping findings to in themes main like characteristics laboratory nature , characteristics laboratory artificial , integration model both of them , and its relevance with issue learning contemporary . Next done stage synthesis conceptual with compare and relate findings between source For formulate patterns , similarities , and differences researchers ' views . Stage end is withdrawal conclusion , namely compile formulation conceptual about urgency , potential , and direction development integration laboratory natural and artificial as strategy strengthening competence Arabic in Islamic boarding schools .

## **RESULTS AND DISCUSSION**

### **Characteristics Laboratory Natural in Arabic Language Learning**

Based on results study library , laboratory natural in learning Arabic is understood as utilization environment real and life daily participant educate as room Study authentic and contextual language . In context Islamic boarding school , laboratory natural includes student dormitories , mosques, and the environment social Islamic boarding school , activities religious , up to informal interactions between students and between students with Ustaz . Environment the provide chance wide for participant educate For use Arabic in general direct in situation communication real , so that Language studied No just as object study , but as tool interaction living social life ( Salsabila et al., 2025).

Approach laboratory natural put participant educate as subject active in the learning process . They No only accept material , but build understanding Language through experience , observation , practice , and reflection . This in harmony with theory constructivism , which views Study as an active process build knowledge based on experiences and interactions with environment . In learning Arabic , construction knowledge happen when participant educate interact in a way direct with context socio-cultural place Language used .

Besides that , laboratory nature is also relevant with perspective ecolinguistics , which emphasizes that Language No can separated from ecosystem social , cultural and environmental place Language the live and thrive . Environment Islamic boarding school functioning as ecosystem linguistics that allows occurrence acquisition Language in a way natural and sustainable . Arabic is practiced in activity daily life , such as informal conversation , announcements , or activity worship , so that learning become more meaningful and contextual ( Depalina , 2025).

Empirical study show that learning based environment natural capable increase involvement active participant educate , motivate learning , and ability communication Because student involved

direct in the process of observing , discussing , and using Language in context real ( Kurniawati , 2018). However thus , the laboratory natural own limitations , especially in aspect standardization material , language input control , and evaluation structured learning . Therefore that , is necessary approach capable supporters complete lack the .

### **Characteristics of Artificial Laboratories in Arabic Language Learning**

Laboratory artificial in learning Arabic is facility designed learning in a way planned and structured with support digital and multimedia technology . Laboratory This usually equipped with audio-visual devices , computers , headsets, devices soft learning language , as well as recording speaker original that allows participant educate practice skills speaking in a way systematic (Ahmadi, 2019).

Superiority main laboratory artificial lies in its ability provide controlled , standardized , and reproducible language input repeated in accordance need participant learn . Through audiovisual media, students can listen correct pronunciation , imitating intonation and expression speaker original , and train speak in situation simulative . A number of study show that use laboratory effective digital language and media in increase skills listening and speaking as well as help participant educate build trust self in communicate use Arabic ( Marleni et al., 2024; Sunarko et al., 2025).

From the side theory learning , laboratory artificial in line with draft blended learning , namely a combined approach learning face advance with learning based technology . Approach This allows flexibility time and place learning , personalization materials , as well as utilization technology For overcome limitations space and resources power . However Thus , learning Arabic only depend on laboratory artificial potential reduce aspect naturalness and context social use Language if No balanced with practice communication real in the environment participant educate .

### **Integration of Natural and Artificial Laboratories**

Analysis results show that integration laboratory nature and laboratory artificial is approach relevant strategies with demands learning Contemporary Arabic . Integration This allows occurrence synergy between experience authentic language and learning structured based technology . Laboratory natural provide context real social and cultural , whereas laboratory artificial strengthen aspect accuracy , structure , and intensity exercise Language through digital media ( Salsabila et al., 2025).

In a way conceptual , integration the can understood as implementation theory operationalized constructivism and ecolinguistics through approach blended learning . Participants educate build competence Language through experience real in the environment Islamic boarding school , then reflect and strengthen experience the through exercise structured , simulation communication , and

modeling language in the laboratory artificial . Empirical study international support effectiveness of the integrative model This . Research by Ziaul Haq et al. (2024) show that integration digital technology in learning Arabic language capable increase involvement students , motivation learning , and results Study in a way significant . Other studies report that implementation *blended learning* that combines practice communication real and digital media impact positive to skills speaking , independence learning , and digital literacy of participants educated (Rani et al., 2023).

### **The Impact of Integration on Strengthening Language Competence**

Integration laboratory natural and artificial give impact significant to strengthening competence Arabic participants education . Competence Language No only covers mastery of grammar and vocabulary , but also the ability use Language in a way precise , effective , and appropriate context communication . Through integration this , participants educate obtain authentic linguistic input at a time standardized , so that skills listening , speaking , reading and writing can develop in a way balanced (Jannah et al., nd).

Besides increase competence linguistics , approach integrative also encourages strengthening performance language , beliefs self , as well as awareness metacognitive participant learners . Participants educate pushed For reflecting on the learning process they through bait come back sustainability , digital portfolio , and evaluation based performance . Although Thus , the implementation integration laboratory natural and artificial Still face challenges , especially limitations facilities and teacher readiness in manage learning based technology and the environment . Therefore that , training pedagogical and technological for teachers to become factor key success application of this model ( Salsabila et al., 2025; Fadillah et al., 2024).

In a way overall , results and discussion This show that integration laboratory nature and laboratory artificial own potential strong as strategy learning innovative , contextual and relevant Arabic with demands modern learning , especially in the environment Islamic boarding school .

### **Challenges, Implications, and Development Directions**

Although own potential big , implementation integration laboratory natural and artificial Still face challenges , such as limitations facility technology , low digital literacy of some teachers, as well as resistance to innovation learning . Therefore that , teacher training becomes factor key success implementation approach this . Training No only covers aspect technical use technology , but also aspects pedagogical , such as design learning based project , evaluation based performance and management learning collaborative .

Implications practical from findings This show that integration laboratory natural and artificial can made into strategy strengthening learning Arabic in Islamic boarding schools . Approach This push more learning contextual , adaptive , and relevant with demands modern learning . To front , research advanced based studies field or experiment required For test effectiveness of the integrative model This in a way empirical and developing guide further implementation applicable .

## CONCLUSION

. Based on synthesis results study literature , research This confirm that integration laboratory nature and laboratory artificial is approach strategic in strengthening competence relevant Arabic with issue learning contemporary . Integration This No just combine two type means learning , but present ecosystem Study mutual language complement , where experience authentic in the environment real enriched by reinforcement structural and reflective through digital technology . Findings This show that learning Arabic becomes more meaningful when practice communication natural , context socio-cultural , and digital media support is designed in a way integrated .

In a way conceptual approach integrative This capable bridge gap between competence and performance language . Laboratory natural contribute to strengthening competence communicative and pragmatic through interaction direct in context life everyday , while laboratory artificial strengthen aspect linguistics , digital literacy , and skills reflective through learning structured . With Thus , integration second laboratory the potential produce learning holistic , adaptive , and development - oriented Arabic skills 21st century .

Implications from findings This for development curriculum is the need design curriculum Arabic which is explicit integrate learning based environment and technology . Curriculum No Again focus on mastery material only , but directed at development experience Study contextual , project collaborative , and the use of digital media in a pedagogical . In addition that , integration This demand existence strengthening the Arabic language teacher training program , both in aspect digital literacy as well as ability designing learning contextual and based project . Teacher training is necessary emphasize competence pedagogical integrative , not only skills technical use technology .

As action further research furthermore recommended For do validation empirical towards the integration model laboratory natural and artificial through studies experiment or study fields in Islamic boarding schools and institutions education others . Research continuation can also be study the effectiveness of this model to each skills Arabic as well as explore strategy evaluation most appropriate learning For approach integrative . With Thus , the study This expected become foothold conceptual for development practice learning innovative , sustainable and responsive Arabic to dynamics modern learning .

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