

# Benchmarking Open-Source LLMs in RAG Systems with Diploma Abstracts

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Retrieval-Augmented Generation (RAG) systems have emerged as a promising method for enhancing language models by integrating external knowledge sources. However, evaluating these systems remains a complex task, as it requires assessing both the retrieval and generation components individually and together. This study offers a comprehensive evaluation of open-source large language models (LLMs) within a RAG framework, using a dataset derived from diploma thesis abstracts. To facilitate systematic evaluation, we created a benchmark set of questions with corresponding reference answers. Employing Elasticsearch for retrieval and several open-source LLMs for generation, we used the Ragas (Retrieval Augmented Generation Assessment) framework to evaluate our system's performance. Our results reveal the strengths and limitations of various models and retrieval strategies, offering insights into optimizing RAG systems for academic and structured knowledge applications.

**Keywords:** RAG, LLM, evaluation, Elasticsearch, Ragas

## References

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