

# Exploring the Link Between Roommate Compatibility and Academic Outcomes: A Systematic Review of Personality-Based Matching Systems

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**Abstract** - The collegiate experience significantly influences students' academic, personal, and social development. Roommate relationships, a central part of shared living arrangements, are crucial for students' psychosocial well-being and academic success. This systematic review aims to evaluate the effectiveness of personality-based roommate matching systems in improving roommate compatibility, fostering personal development, and enhancing academic performance. A comprehensive search of the Google Scholar and Scopus databases was conducted to identify studies on automated and personality-based systems. Selected studies were screened and analyzed to assess the impact on resource allocation, student satisfaction, and housing efficiency. Personality-based systems - such as fuzzy clustering models, genetic algorithms, and rule-based algorithms - significantly outperform traditional methods in enhancing compatibility and resource allocation. Findings highlight the positive impact of roommate compatibility on students' self-confidence, communication, and independence, with female students facing unique challenges. Positive relationships, especially among students with high extraversion and conscientiousness, correlate with improved academic outcomes, while negative interactions and depressive symptoms are linked to lower performance and well-being. Personality assessments, like the Open Four Temperaments Scales Test, show promise in reducing conflicts and increasing satisfaction. The study suggests that integrating personality profiling with technology can provide supportive living environments in higher education. However, gaps remain in understanding their impact across different institutional and cultural contexts. Further research is needed to explore the long-term efficacy of these systems. This review provides insights for institutions seeking to optimize hostel management practices and support student development.

**Keywords:** Personality-Based Roommate Matching, Roommate Compatibility, Academic Performance, Psychosocial Well-Being, Housing Efficiency

## I. INTRODUCTION

The collegiate experience is a transformative period in young adults' lives, encompassing not only academic pursuits but also personal and social growth [1]. This period is marked by relationships formed during university years, especially among students sharing the same hall of residence or even rooms. These relationships are pivotal in shaping students' psychosocial well-being, influencing their academic

performance and overall satisfaction with the university experience [2]. Globally, university campuses offer diverse cohabitation contexts, each with unique social, institutional, and cultural dynamics.

For example, Chinese universities often assign a single dormitory room to four to six students throughout their undergraduate years, reflecting a communal living philosophy embedded in their higher education settings [3].

Despite this, research in higher education literature has largely overlooked how students use shared spaces and the interpersonal dynamics that arise. Existing studies on roommate relationships primarily focus on conflict resolution and social support systems, often neglecting the broader contextual factors that influence roommate compatibility and relationship satisfaction [4]. Moreover, while technological advancements have introduced innovative approaches to roommate assignment, such as machine learning-based matching systems, their impact on students' dormitory experiences has yet to be fully explored [5].

Theoretical frameworks in developmental psychology emphasize the significance of interpersonal relationships, including roommate bonds, in young adults' psychosocial growth and identity formation [6]. Erikson's stage theory posits that the primary developmental task during young adulthood is the establishment of intimate relationships, while Chickering and Reisser's vectors of psychosocial development underscore social functioning's role in college students' holistic growth.

Additionally, Arnett's theory of emerging adulthood highlights the prolonged identity-forming process typical of the college years, during which romantic and platonic interactions provide essential spaces for personal development and self-exploration [2]. Empirical research supports the theoretical importance of interpersonal connections by linking social functioning to various aspects of psychological well-being, such as environmental mastery, personal growth, and self-acceptance [7].

Despite theoretical and empirical support for the critical role of roommate relationships in student development, significant gaps persist in the literature. Few studies have explored the nuanced, lived experiences of students in shared living arrangements, particularly across diverse cultural and institutional contexts [2], [3]. Moreover, while technology-enabled roommate matching systems hold promise for enhancing roommate compatibility, their efficacy and broader implications require comprehensive examination [5], [8], [9].

Furthermore, personality-based matching systems show potential in addressing interpersonal conflicts between roommates and improving satisfaction, yet the scalability and adaptability of these systems across various institutional settings remain underexplored. This systematic review seeks to bridge these gaps by synthesizing and analyzing current research on the effectiveness of personality-based roommate matching systems and their impact on students' academic performance, personal development, and overall well-being.

### A. Rationale

There is a need for a comprehensive understanding of personality traits' role in roommate relationships and their impact on university students' academic performance. By synthesizing evidence from a wide range of studies, this systematic review aims to address gaps in the literature and provide an overview of the relationship between personality traits, roommate compatibility, and academic outcomes. Such insights are crucial for developing effective roommate matching systems that account for both logistical factors and individual personality differences. This review aims to contribute to enhancing student well-being, satisfaction, and academic success in higher education settings.

### B. Objectives

The PICOS framework was used to outline the objectives guiding this systematic review of personality-based roommate matching systems in higher education institutions. This review aims to address fundamental questions regarding the outcomes of these interventions and their effectiveness in promoting positive roommate relationships among university students.

The analysis examines evidence from existing studies to assess the target population, interventions, comparisons, outcomes, and study designs of personality-based roommate matching systems. It aims to provide insights into the role of these systems in enhancing the well-being and academic success of university students in shared accommodations.

*1. Population:* What are the characteristics of university students or college-aged individuals included in studies evaluating personality-based roommate matching systems?

*2. Intervention:* What types of personality-based roommate matching systems or interventions have been implemented in higher education settings?

*3. Comparison:* How do personality-based roommate matching systems compare with alternative methods or interventions for roommate assignment in terms of effectiveness and outcomes?

*4. Outcome:* What are the effects of personality-based roommate matching systems on roommate relationship quality, satisfaction, and overall well-being among university students?

*5. Study Design:* What types of study designs have been used to evaluate personality-based roommate matching systems, including randomized controlled trials (RCTs), quasi-experimental studies, observational studies, and qualitative research?

## II. METHODOLOGY

This systematic review was conducted through a comprehensive search of articles relevant to the review title on two major databases: Scopus and Google Scholar. This approach ensures that the research maintains a standard level of reliability and encompasses a wide range of studies. Keywords relevant to and synonymous with the review title were combined in the article search.

### A. Eligibility Criteria

The PICOS [10] framework outlined below served as the basis for article inclusion in the review.

*1. Population:* University students or college-aged individuals.

*2. Intervention:* Studies evaluating roommate matching systems or personality-based interventions.

*3. Comparison:* Studies comparing personality-based roommate matching systems with alternative methods or interventions for roommate assignment.

*4. Outcome:* Studies assessing the impact of personality-based roommate matching systems on roommate relationship quality, satisfaction, and overall well-being.

*5. Study Design:* Randomized controlled trials (RCTs), quasi-experimental studies, observational studies, and qualitative research investigating personality-based roommate matching systems in higher education settings.

### B. Inclusion Criteria

1. Studies involving university students or college-aged individuals.

2. Studies evaluating personality-based roommate matching systems or interventions.

3. Studies assessing the impact of personality-based roommate matching systems on roommate relationship quality, satisfaction, and overall well-being.

4. Articles published in English.

5. Articles published between January 2014 and May 2024.

### C. Exclusion Criteria

1. Studies focusing exclusively on populations other than university students or college-aged individuals.
2. Studies that do not evaluate personality-based roommate matching systems or interventions.
3. Studies that do not assess the impact of personality-based roommate matching systems on roommate relationship quality, satisfaction, and overall well-being.
4. Articles not available in English.
5. Articles published outside the specified timeframe.
6. Case reports, reviews, editorials, letters, conference abstracts, and meta-analyses.

### D. Source of Information

Google Scholar and Scopus databases were extensively searched to retrieve studies relevant to this research. The search employed key terms pertinent to this study, including “roommate,” “dorm mate,” “residence,” “dormitory,” “personality trait,” “character,” “behavior,” and others.

### E. Search Strategy

The Scopus database and Google Scholar served as the primary sources for literature in this systematic review. The search incorporated keywords combined with Boolean operators to gather articles relevant to the research. Among the keywords used were “roommate,” “dorm mate,” “residence,” “dormitory,” “personality trait,” “character,” and “behavior.”

To ensure the inclusion of recent and relevant studies, the search query was limited to articles published in English between January 2014 and May 2024, focusing on original research articles.

On the Scopus database, 241 documents were found using the query string below:

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TITLE-ABS-KEY ( development OR design OR creation OR build* OR implementation ) AND ( web-based OR website OR online OR internet ) AND ( roommate OR “dorm mate” OR housemate OR residence OR dormitory ) AND ( ( matching OR pairing OR compatibility OR allocat* ) AND ( algorithm OR techniques OR logic ) ) AND ( system OR application OR platform OR software ) AND ( personality OR psychological OR behav* OR trait OR charact* ) AND ( profiling OR assessment OR evaluation OR analysis ) AND PUBYEAR > 2013 AND PUBYEAR < 2025 AND ( LIMIT-TO ( SUBJAREA , “SOCJ” ) OR LIMIT-TO ( SUBJAREA , “ENGI” ) OR LIMIT-TO ( SUBJAREA , “COMP” ) OR LIMIT-TO ( SUBJAREA , “MEDI” ) OR LIMIT-TO ( SUBJAREA , “PSYC” ) OR LIMIT-TO ( SUBJAREA , “DECI” ) OR LIMIT-TO ( SUBJAREA , “ARTS” ) OR LIMIT-TO ( SUBJAREA , “NEUR” ) OR LIMIT-TO ( SUBJAREA , “HEAL” ) OR LIMIT-TO ( SUBJAREA , “NURS” ) OR LIMIT-TO ( SUBJAREA , “ENVI” ) ) AND ( LIMIT-TO ( DOCTYPE , “ar” ) ) AND ( LIMIT-TO
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( PUBSTAGE , “final” ) ) AND ( LIMIT-TO ( SRCTYPE , “j” ) ) AND ( LIMIT-TO ( LANGUAGE , “English” ) )
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On Google Scholar, a manual search of studies was conducted by searching for combinations of key terms synonymous with the title of the review. This search yielded 126 documents deemed relevant to the research.

### F. Data Management

Studies collected from the Scopus database using the predetermined query string were exported as RIS files and subsequently screened using Hubmeta [11]. Studies from Google Scholar were imported into the Mendeley reference manager using the Mendeley Web Importer, then exported as RIS files and uploaded into Hubmeta for review. The web-based application Hubmeta includes an AI-driven feature that enhances accuracy in the review process. The most recent searches of articles in the aforementioned databases were conducted on May 12, 2024.

### G. Selection of Studies

After the studies retrieved from the database searches were uploaded to the systematic review application Hubmeta, an initial review was performed to eliminate duplicate studies. This was followed by screening, which involved evaluating titles and abstracts to ensure alignment with the predefined inclusion criteria and relevance to the study. Articles considered potentially relevant were then analyzed by reviewing their full texts to confirm they met the inclusion criteria, and key data were extracted for analysis.

### H. Data Extraction

The screening and data extraction procedures were documented using the PRISMA flowchart [12], which illustrates the article selection process and promotes the transparency and reliability of the reported results. The PRISMA flowchart includes steps that display the number of articles gathered, screened, retrieved, assessed for eligibility, and finally subjected to review. This process aligns with the PRISMA guidelines [13], ensuring the credibility of the systematic review [14].

### I. Risk of Bias

To ensure the reliability and credibility of the systematic review, a thorough risk of bias assessment was conducted. This involved a rigorous evaluation of the studies selected for review, following a predefined guideline or protocol. Eligibility criteria were established as the standard for study inclusion; studies that did not meet these criteria or lacked sufficient content relevant to answer the research questions were excluded. Additionally, as the sole reviewer, I conducted an extensive search across several databases and sources to mitigate the risk of bias. Any inconsistencies were addressed through thorough evaluation and the use of relevant literature.

**PRISMA FLOWCHART**

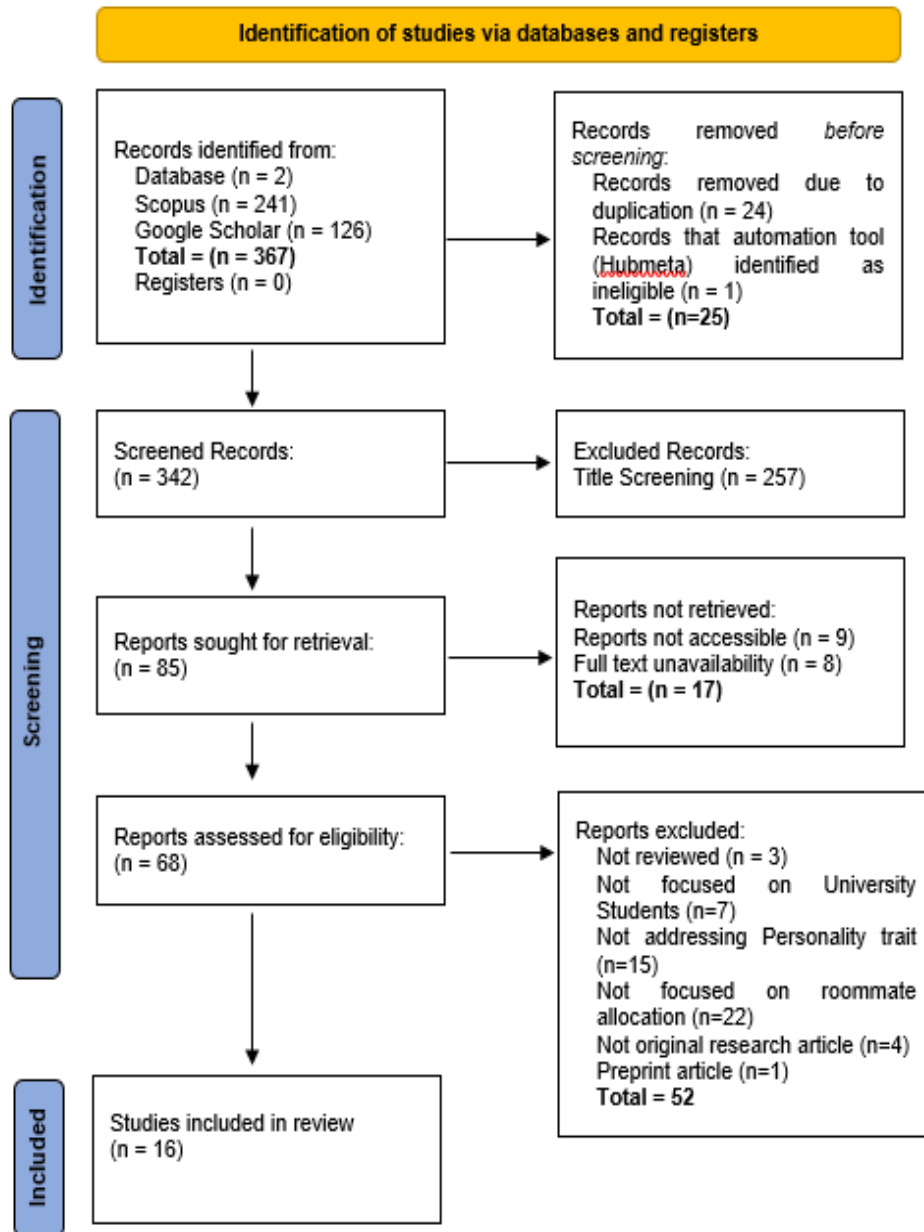


Fig. 1 The screened studies were documented using a PRISMA flowchart

**III. RESULTS OF THE STUDY**

This review addressed key questions regarding the effectiveness of personality-based roommate matching systems, particularly in tertiary academic institution settings, and how these systems promote positive roommate relationships among university students.

Existing literature was analyzed, and the evidence was synthesized to gain a comprehensive understanding of the target population, interventions, comparisons, outcomes, and study designs of personality-based roommate matching systems.

Out of the 367 studies gathered from the two major databases (Scopus and Google Scholar), 16 studies met the predefined eligibility criteria after undergoing stringent screening and review procedures based on the inclusion and exclusion criteria.

Table I provides a summary of the eligible studies, detailing their titles, authors, publication year, research objectives, methodology, key findings, and limitations. These studies vary in scope, design, population, and intervention, highlighting their main characteristics and contributions to the research questions.

TABLE I SELECTED STUDIES FOR REVIEW

Sl. No.	Author(s) (Year)	Title	Research Objectives	Methodology	Key Findings	Limitations
1	Ayanlowo <i>et al.</i> , (2014)	Development of an Automated Hostel Facility Management System [15].	Objectives encompass centralizing hostel data, automating administrative processes, enabling efficient allocation, and ensuring accurate record-keeping. Modular design facilitates independent development and integration of various system components.	The study employs a systematic system analysis and design methodology, starting with data collection and understanding business processes. It uses Visual Basic for programming and Microsoft Access for database development, focusing on modular design and data flow diagrams for input and process design.	Key findings include enhanced hostel management through automation, streamlining administrative processes, reducing data redundancy, and improving reliability and efficiency. The system enables easy tracking of student accommodation, automates billing processes, and enhances data handling and report generation.	Limitations include potential errors in data input, complexities in system integration, and the need for thorough user acceptance testing to ensure system functionality and usability.
2	Iftikhar <i>et al.</i> , (2015)	A Qualitative Study Investigating the Impact of Hostel Life [16].	The study aimed to explore the impact of hostel life on students' behaviors and experiences through a pilot study on twenty students in Pakistan. Convenience purposive sampling was used for data collection and semi-structured interviews were conducted.	Ten hostel students from various universities in Lahore were selected through convenience purposive sampling for a study using semi-structured interviews and grounded theory analysis to identify themes and patterns. I.	The study found hostels are an excellent environment for personal growth, emotional bonding, and socialization, with students describing hostel life as a memorable experience, highlighting positive impacts such as life skills development and academic benefits.	The study's generalization is limited due to its quantitative convenience sampling, which involved only five male and five female hostel students from different Pakistani cities and provinces, making it not a representative sample.
3	Omonijo <i>et al.</i> , (2015)	Effects of College Roommate Relationships on Student Development at a Private University, Southern Nigeria [17].	The study aimed to explore the impact of college roommate relationships on student development at a Southern Nigerian private university, focusing on academic performance, spiritual life, social vices, emotional stability, and resource management.	The study used a descriptive survey design with 470 respondents from a 4,200-student population, collecting data on socio-demographic characteristics and roommate relationships, and tested hypotheses using Spearman's correlation method at a 0.01 significance level.	The study reveals a strong link between roommate relationships and student development, with positive relationships resulting in higher levels of student development across all dimensions, impacting academic performance, social and personal growth, and psychological well-being.	The research was limited to only one private university in Southern Nigeria; therefore, the results may not be generalizable to other universities or regions. Second, the study was limited to the use of self-report questionnaires, which may be subject to response bias.
4	Wilson <i>et al.</i> , (2015)	Personality and Friendship Satisfaction in Daily Life: Do Everyday Social Interactions Account for Individual Differences in	The Objective was to investigate how individual differences in personality traits, interpersonal behavior, and emotion regulation relate to friendship	The researchers used an ecological momentary assessment (EMA) method, which involved participants reporting on their daily social interactions, mood,	The key findings of the study revealed that participants who scored high on certain personality traits, including extraversion, agreeableness, and emotional stability,	A limitation of the study is that the EMA method relies on self-reported data, which may be influenced by participants' memory biases, social desirability

		Friendship Satisfaction [18]?	satisfaction in daily life.	and behavior through a questionnaire delivered on their smartphones five times per day for seven days. The questionnaire consisted of various Likert-type items, along with open-ended questions, and participants were also asked to report on their friendship satisfaction.	reported higher levels of friendship satisfaction within their daily lives. Additionally, the study found that negative emotions and social anxiety predict lower levels of daily friendship satisfaction.	bias, and the degree to which they are motivated to complete the questionnaire accurately and honestly.
5	Yu <i>et al.</i> , (2016)	A Research on the Model of University Apartment Occupancy Distribution Based on the Student Preferences [19].	This study aims to develop a university apartment occupancy distribution model based on student preferences, analyze accommodation preference data, and allocate dormitories using Fuzzy clustering. It also aims to design an online student dormitory management system.	A fuzzy clustering model is established to categorize students based on accommodation preferences. Students input their preferences through an online system, and clustering decisions are made automatically.	The study demonstrates that the Fuzzy clustering model effectively allocates university apartment occupancy based on student preferences, proving its potential for online student dormitory management systems, as confirmed by numerical simulations.	The study's limitations include testing the Fuzzy clustering model with larger samples, benchmarking its predictive performance with other models, and exploring other variables affecting students' accommodation preferences.
6	Shekhawat <i>et al.</i> , (2016)	Usability Test of Personality Type within a Roommate Matching Website: A Case Study [20].	The objective of this study was to investigate the usability of personality type integration within a roommate matching website. The researchers aimed to determine the value that presenting personality type information had on choosing compatible roommates.	The research team conducted two rounds of surveys using a combination of qualitative and quantitative methods, with the first round involving a questionnaire-based quiz, and the second round aimed to enhance the results.	The team found that presenting personality information on a roommate matching website has value, but the method of presentation matters. Users were open to the option of using personality type to find compatible roommates if the survey prevented indecision and the feedback was useful.	The study's scope was limited due to unclear feedback questions, lack of demographic data collection, and lack of access to users unhappy with their current roommates, resulting in ambiguous conclusions and limited data analysis.
7	Ogbuanu Ogochukwu Vivian (2018)	Design And Implementation of Hostel Information System [21].	The study aims to address hostel accommodation challenges by designing an automated system. Objectives include creating a central database of available rooms, adding new hostels and rooms, printing allocation evidence, generating occupancy reports, and ensuring eligible student allocations.	The methodology employed is the V-Model OOAD methodology, a linear development approach used during the software development life cycle. It progresses through various stages, from analysis to implementation, resembling the waterfall model.	Key findings include the system's ability to streamline hostel allocation, reducing time and queuing during resumption. It facilitates accurate tracking of hostel occupancy and expedites students' settling down for the academic session.	Limitations include network connectivity issues, login difficulties for staff and students, inability to allocate hostel space without uploaded payment details, and the requirement for students to promptly acquire accommodation slips post-allocation.

8	McCredie <i>et al.</i> , (2020)	Prospective prediction of academic performance in college using self-and informant-rated personality traits [22].	The research objectives of the study were to examine the relationship between personality traits and academic performance in college, as well as to explore the predictive utility of self- and informant-rated personality traits in this context.	The study involved 209 students adjusting to college life, with parents and peers rating their personality using questionnaires and the NEO Five-Factor Inventory. Data from all sources was analyzed to assess personality traits.	The study revealed that self-rated conscientiousness significantly predicts academic performance, while informant-rated conscientiousness doesn't. Informant-rated extraversion also has a significant predictive influence on academic performance, unlike self-rated extraversion.	This study had a relatively small sample size and relied heavily on self-report measures of personality traits, which can be subject to bias or error. Additionally, the study was conducted at a single university in the United States, which may not generalize to other populations or contexts.
9	Adetunji <i>et al.</i> , (2020)	Hostel Allocation System: Beyond the First Come First Serve Technique [23].	The purpose of the study was to develop an automated system that would allocate students into hostels based on their personality traits, thus considering each student's personality such as introverts, extroverts, sanguine etc.	The methodology employed in the study involved an extensive review of existing hostel allocation systems to understand their current state and the adoption of the open four temperament scale test to design the sorting algorithm and PHAS framework.	The key finding of the study was that the traditional manual hostel registration process is time-consuming for both students and staff; thus, there is a need to develop an automated system that considers students' personalities to improve the traditional system's efficiency.	The limitation of the study is that the PHAS has not been tested in real-time, and it is limited to the Babcock University case study.
10	Fosnacht <i>et al.</i> , (2020)	The Relationship of First-Year Residence Hall Roommate Assignment Policy with Interactional Diversity and Perceptions of the Campus Environment [24].	The Objectives were to examine how different roommate assignment policies in first-year residence halls affect the levels of interactional diversity and perceptions of the campus environment among college students.	The study used a quantitative research design and regression analysis to analyze data from the National Survey of Student Engagement, examining the relationship between roommate matching methods, interactional diversity, and campus environment perceptions, controlling for demographic and institutional factor	The study revealed that first-year residence hall roommate assignment policy significantly impacts interactional diversity, with matching based on interests, academic majors, and personal characteristics, but its impact on campus environment perceptions is less clear.	The research design was correlational, unable to establish causal relationships between roommate assignment policy and interactional diversity and campus environment perceptions. Additionally, the sample may not be representative of all on-campus housing institutions.
11	Alfred <i>et al.</i> , (2022)	Automated Scheduling of Hostel Room Allocation Using Genetic Algorithm [25].	The study aims to create a hostel room allocation system using a hierarchical heuristic approach, focusing on selection and allocation stages, using a rank-based selection method and an evolutionary operation genetic algorithm for	The study utilized simulations and MATLAB to assess the efficiency and effectiveness of a hostel room allocation system, employing a genetic algorithm technique and mathematical models to address room allocation	The study reveals that a hierarchical heuristic approach can effectively solve hostel room allocation problems, considering constraints and optimization objectives. It outperforms existing methods,	The study focused on algorithm implementation, neglecting socio-organizational factors in hostel management. The proposed approach was not compared to other methods, potentially affecting results'

			university room optimization.	constraints and optimization issues.	achieving a room allocation success rate of 93.92% with a fitness value of 0.9963.	generalization and validity. Further research is needed to cover broader constraints and optimization objectives.
12	Azeeta <i>et al.</i> , (2021)	An Intelligent Student Hostel Allocation System Based on Web Applications [26].	The study aims to develop an intelligent web-based student hostel allocation system, utilizing decision tree algorithms, MySQL, PHP, HTML/CSS, and Sublime Text, and validating its effectiveness.	The study utilized a three-tier architecture with HTML/CSS for client, PHP for application, and MySQL for data, developed using Sublime Text, and validated using XAMPP, with UML diagrams for system visualization.	One of the key findings of the study is that the developed system could accurately allocate rooms based on the established criteria.	The study's technical implementation may overlook socio-organizational factors affecting hostel management, and its limitations include assuming homogeneity in student populations and using a deterministic decision tree algorithm for complex, dynamic situations.
13	Adeniyi <i>et al.</i> , (2021)	Personality Types, Demographic Variables and Roommate Relationship Satisfaction Among Undergraduates of Obafemi Awolowo University Ile-Ife, Nigeria [27].	This study aimed to explore the satisfaction levels of undergraduates at Obafemi Awolowo University with roommates, investigate the correlation between personality types (A and B) and satisfaction, and examine demographic factors like sex and age.	The study used the Students Roommate Relationship Satisfaction Scale (SRRS) and Personality Types Questionnaire (PTQ) to gather demographic data and respondent responses on a 4-point Likert rating scale, determining mean and standard deviation for roommate relationship satisfaction levels.	The study revealed a significant correlation between personality types (A and B) and roommate relationship satisfaction among undergraduates, suggesting that individuals with certain personality types are more likely to experience high levels of satisfaction.	The study primarily examined demographic variables like sex and age, neglecting other factors like cultural background or socioeconomic status, suggesting the need for further research to understand the factors affecting roommate relationship satisfaction among undergraduates.
14	Foulkes <i>et al.</i> , (2021)	Social relationships within university undergraduate accommodation: a qualitative study [4]	The research objectives of this study were to examine the role of housemates in student wellbeing across year groups at multiple UK universities. The study aimed to explore in depth the phenomenon of social relationships within undergraduate accommodation.	Researchers interviewed 40 participants in 13 UK university accommodations and conducted a four-step data analysis, including independent coding by three researchers, additional coding by the first author, and theme construction.	The study reveals four themes highlighting the complex and often conflicting nature of social relationships within university accommodation. Participants reported both positive and negative relationships with housemates, with positive relationships impacting well-being more than negative ones.	The study's limitations include its reliance on self-reported data, potential bias or inaccuracy, and its focus on UK universities and its small sample size, which may limit the generalizability of its findings.



15	Quinn <i>et al.</i> , (2023)	Understanding the role of depressive symptoms in academic outcomes: A longitudinal study of college roommates [28].	The study examined the correlation between depressive symptoms among college students and roommates, their impact on GPAs, course withdrawals, the moderating effect of dyadic closeness, and the indirect effects of early depression on second-semester college outcomes.	A study involving 484 undergraduate university roommates assessed biological and behavioural measures, using self-reported data such as dyadic closeness, depressive symptoms, ACT and SAT scores, withdrawal from courses, and GPAs, and used moderation and mediation models for data analysis.	The study revealed a negative correlation between depressive symptoms, course withdrawal, and college academic outcomes, with roommate depressive symptoms impacting GPA in the first semester but positively in subsequent semesters, and depressive contagion linked to course withdrawal.	The study's data collection, primarily self-reported, may have distorted students' perceptions of their academic abilities, potentially leading to inaccurate results. Additionally, the study's focus on same-sex roommate dyads and lack of other social interactions suggest further exploration is needed.
16	Guanyi Xu (2023)	Roommate Relationships in Chinese University Dormitories: Students' Life Experience and Perception [3]	The study aimed to investigate Chinese university students' dormitory living experiences, focusing on roommate relationships, and the impact of communication, emotions, and coping strategies on these factors in dorm life on roommate relationships.	The study used a qualitative approach and collected data through semi-structured interviews, photography, and emotion mapping. The study recruited both undergraduate and graduate students from a Chinese university, and the analysis of the data was guided by a grounded theory approach.	The study revealed that communication is crucial for building positive roommate relationships, and emotions significantly influence communication and coping strategies. Additionally, students' dormitory experiences varied based on the nature of their relationships with their roommates.	The study's findings may be limited by cultural factors, reliance on self-reported data, and the absence of nonverbal factors like tone of voice, as well as potential biases due to the sample size from one university.

*A. Summary of Findings*

To address the research questions and objectives of this systematic review, the key findings extracted from the included studies were synthesized. The analysis integrates the methodologies employed in these studies, as seen in TABLE I, along with the results obtained, to offer a comprehensive overview of how personality-based roommate matching systems impact student outcomes.

*B. Effectiveness and Outcomes of Personality-Based Roommate Matching Systems*

Conventional manual methods of managing hostel facilities pose significant challenges for educational institutions. These methods are often time-consuming, resource-intensive, and prone to errors and data redundancy. Several studies suggest that automated hostel management systems can address these issues by optimizing resource allocation through the application of appropriate mathematical models [15].

Such systems, which encompass room administration, student assignment, and report generation, demonstrate greater efficiency and resource utilization compared to traditional techniques.

One proposed system utilizes a fuzzy clustering model to assign university residence halls based on student preferences. This model provides a data-driven allocation method, enhancing both satisfaction and efficiency while offering a theoretical foundation for real-world implementation in college dormitory allocation [19]. Similarly, another system employs a genetic algorithm to automatically assign dorm rooms to students, effectively considering multiple constraints in the assignment process. This method outperforms traditional approaches in terms of fitness and convergence rate, demonstrating improved results in managing large-scale hostel facilities [25].

*C. Impact of Hostel Life on Students' Personality and Social Networks*

Hostel life plays a crucial role in students' personal development, fostering self-confidence, communication skills, and independence. The structured environment and peer interactions within hostels facilitate social network formation, positively impacting academic performance and the acquisition of new skills [16]. However, hostel life can also introduce stress, particularly for female students, who may face additional restrictions due to safety concerns. This suggests that adequate institutional support is essential to mitigate negative effects.

#### *D. The Effect of Roommate Relationships on Academic Performance*

Students with positive roommate relationships are more likely to exhibit emotional stability and achieve academic success [17]. Research has shown a strong correlation between healthy roommate interactions and improved academic performance. The quality of friendships and social interactions significantly influences students' satisfaction with their friendships and their overall well-being, especially for those with varying levels of agreeableness and extraversion [18], [29]. More important than the number of social connections is their quality, with negative social experiences proving particularly detrimental for students who score low on emotional stability and agreeableness.

Personality traits such as extraversion and conscientiousness are strong predictors of academic performance. Studies indicate that combining self-reported and informant-rated personality assessments provides more reliable predictions of academic outcomes than self-reports alone [22]. This integration of multiple perspectives enhances the validity of personality assessments and underscores their impact on students' academic performance.

#### *E. The Relationship between Personality Traits, Relationship Quality, and Well-Being*

Roommate relationships are complex and influenced by several factors, including personality traits, lifestyle differences, communication styles, and external stressors. A peaceful living environment requires the ability to manage both negative and difficult interactions while fostering positive, supportive relationships [4]. Students' GPAs are negatively impacted by depressive symptoms, which are often mirrored by their roommates, further affecting both academic outcomes and overall well-being [27], [28], [30].

#### *F. Implementation of Personality-Based Roommate Matching Systems*

Several personality-based roommate matching systems have been implemented to increase roommate satisfaction and compatibility. For example, systems that utilize the Open Four Temperaments Scales Test classify students into sanguine, choleric, melancholy, and phlegmatic categories and assign rooms based on those classifications [23]. Additionally, some systems employ SQL Server to manage hostel allocations, ensuring that eligible students are assigned rooms promptly while also generating comprehensive statistical reports on occupancy [21], [31]. This method aims to reduce conflict and increase satisfaction. Furthermore, it has been discovered that first-year housemate assignment procedures that take into account more factors than just race or ethnicity enhance interactional diversity and improve students' impressions of the campus community [20], [24].

Conclusively, a comprehensive understanding of the impact of personality-based roommate matching systems on student

outcomes is provided by synthesizing these studies. Automated and personality-based systems show promise in improving roommate compatibility, reducing conflicts, and enhancing academic performance and personal development. The integration of various methodologies and data sources strengthens the validity of these findings, offering valuable insights for higher education institutions to optimize their hostel management practices.

### **IV. DISCUSSION OF THE STUDY**

The comprehensive summary of the reviewed literature provides insights into several topics, such as the application of personality-based roommate matching systems and their effectiveness; the effects of hostel life on students' social networks and personalities; the impact of roommate relationships on students' academic performance; the relationship between personality traits and relationship quality; and the influence of roommate relationships on students' social networks and personalities.

The findings indicate that conventional manual methods for managing hostel facilities present significant challenges for educational institutions, as they are time-consuming, resource-intensive, and vulnerable to errors and data redundancy [32]. In contrast, automated hostel facility management systems offer promising solutions by optimizing resource allocation and management through mathematical models, such as fuzzy clustering and genetic algorithms [19], [26], [33], [34]. These systems, which include room and student administration as well as report generation, greatly enhance efficiency and resource utilization compared to conventional techniques.

Hostel life plays a crucial role in students' personal development, fostering self-confidence, communication skills, and independence [16]. Despite the benefits of hostel life, studies show that it can also be stressful, particularly for female students, who face additional restrictions due to safety concerns. This suggests that sufficient institutional support is necessary to mitigate negative impacts.

There is a significant correlation between positive roommate relationships and improved academic performance, emphasizing the importance of supportive friendships and emotional stability [18]. It is also worth noting that friendship quality is more important than quantity when considering students' overall well-being and satisfaction, and personality traits such as extraversion and conscientiousness are strong determinants of academic success [22].

Roommate relationships are intricate and affected by various factors, including communication styles, lifestyle differences, and personality traits, all of which significantly impact the quality of relationships between roommates [4]. Depressive symptoms, often mirrored by roommates, negatively impact students' academic performance, highlighting the connection between social dynamics and mental health [28].

To improve compatibility and satisfaction among students, several personality-based roommate matching systems have been implemented. Some of these systems employ personality tests, such as the Open Four Temperaments Scale Test, which categorizes students into their respective personality types and assigns them rooms based on these classifications. Furthermore, first-year housemate policies that consider broader qualities promote interactional diversity and enhance students' perceptions of the campus environment [24], [35].

The findings of the systematic review have various implications for practices and research in tertiary educational institutions. Educational institutions can utilize automated hostel facilities management systems to optimize resource allocation, increase efficiency, and enhance student satisfaction. Creating strong roommate relationships and providing adequate support can also help students achieve academic success and contribute positively to their overall well-being. Furthermore, employing personality-based roommate matching algorithms can assist schools in addressing compatibility concerns and creating more supportive living environments for their students.

One of the merits of this systematic review is its extensive search approach, which included exploring several databases and applying stringent inclusion criteria. The utilization of multiple approaches and data sources in the systematic review enhances the reliability and generalizability of the results. However, because the review only includes studies published within a specific timeframe and those available in English, it may be subject to potential publication bias. Additionally, the heterogeneity of the study designs and outcome measures may complicate the synthesis of the results.

The results of this systematic review align with previous research demonstrating the importance of roommate relationships and hostel living for students' well-being and academic success [36], [37]. Nonetheless, this review expands on earlier studies by combining evidence of the effectiveness of personality-based roommate matching systems and their application in higher education environments. Through a comparative analysis of findings from multiple studies, this review offers important recommendations for future research and practical applications in this field.

In conclusion, the synthesis of these findings provides significant insights into the influence of personality-based roommate matching systems on academic achievements. Optimizing hostel management practices can foster supportive social environments that enhance academic performance, well-being, and student satisfaction. Further research is necessary to examine other variables influencing roommate relationships and the long-term effects of this intervention.

## V. CONCLUSION AND RECOMMENDATION

In conclusion, this systematic review highlights the effectiveness of personality-based roommate matching systems in promoting positive student experiences, improving academic performance, and optimizing hostel management. A systematic synthesis of studies demonstrates that personality trait-based automated systems provide viable solutions to challenges associated with manual and traditional approaches. These systems support students' personal growth and well-being while optimizing resource allocation and management. The results underscore the impact of hostel life on the development of students' personalities and the importance of healthy roommate relationships for both academic performance and emotional stability. Furthermore, the implementation of diverse personality-based matching systems signifies a shift towards more effective and customized methods for room assignments, which may enhance student satisfaction and reduce conflicts.

Although the results are encouraging, it is essential to recognize the limitations and potential areas for further study. Methodological factors that could affect the generalizability of the results include variations in sample size and study design. Additionally, more research is needed to identify the best practices for applying personality-based matching systems to evaluate their long-term impacts on student outcomes.

Overall, this systematic review provides valuable insights for educational institutions aiming to improve their resident management procedures and enhance the overall student experience. By utilizing personality-based matching systems, academic institutions can increase the efficiency of their hostel assignment processes, promote positive roommate relationships, and ultimately contribute to the overall growth and success of their students.

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