Abjadia : International Journal of Education, 09 (02): 355-370 (2024)
DOI: 10.18860/abj.v9i2.27835

ANALYSIS OF STUDENTS' SELF AWARENESS IN MEDIATING THE INFLUENCE OF MANAGEMENT INFORMATION SYSTEMS AND ACTION CARD SYSTEMS ON REINFORCEMENT OF LEARNING

M. Fadli Al Azhari [1]*, Mukhlison Effendi [2]
[1, 2] Department of Islamic Education Management, IAIN Ponorogo, Indonesia

Abstract

Self-awareness helps students understand their own strengths, weaknesses, interests, and learning styles. With better self-understanding, students can use management information systems and action cards more effectively according to their learning needs. This research aims to explore the role of self-awareness as a mediator of influence between management information systems, action card systems, and learning reinforcement. The survey method was used to collect data based on purposive sampling from 64 MA Darul Huda Ponorogo students. Data collection was carried out using a questionnaire consisting of a Likert scale with 4 alternative answers. PLS-SEM analysis was used to analyze data and test the conceptual model. The results of the analysis show that the management information system has no significant effect on self-awareness and learning reinforcement. In addition, self-confidence was proven not to mediate the effect of management information systems on strengthening learning. These findings highlight the importance of self-awareness in facilitating the development of reinforced learning through management information systems and participation in action card systems. The practical implication of this research is the need for the role of classmates in strengthening learning, which does not only focus on aspects of teacher support, but also on aspects of self-reflection. Research supports efforts to design professional development programs that strengthen student self-awareness and integrate management information systems and action card systems as effective strategies for enhancing learning reinforcement.

Keywords: Self-awareness, management information system, action card system, reinforcement learning, PLS-SEM.

* Correspondence Address:	m.fadli.al@iainponorogo.ac.id

Article History	Received	Revised	Accepted	Published
	2024-06-03	2024-07-28	2024-07-31	2024-08-15

INTRODUCTION | مقدمة

In educational institutions there are other factors that support the strengthening of learning, one of which is the management information system and the action card system (Camilleri & Camilleri, 2022; Masaeid et al., 2022). Because it can increase students' self-awareness and strengthen learning (Barzel et al., 2019; Espino et al., 2023). From the observations, students' self-awareness and strengthening of learning at MA Darul Huda is quite good because students are also taught to be independent and also taught self-control, but this does not rule out the possibility that students here will still be lazy in carrying out learning activities at school. Self-control in question is a situation where a person in his actions can always control himself so that he can control various desires that are too excessive (Blackmore et al., 2021; Fernandez-Perez & Martin-Rojas, 2022).

According to Rodríguez-Jiménez et al. (2022), self-control includes order in life and compliance with all regulations, in other words, students' actions are always within the corridors of discipline and school regulations. So this will foster a sense of discipline in students to follow every rule that applies at school. To support student awareness and strengthen student learning, facilities such as technology used in management information systems and action card systems in education are also needed. According to Fawait et al. (2020), disciplinary problems in Indonesia include students' lack of awareness in maintaining calm in class, which is rarely discussed even though it often occurs.

This problem makes the teacher have to reprimand the student which makes the conditions even less conducive because other students will definitely not maintain calm. Furthermore, it can disturb the concentration of other students who want to focus on paying attention to the teacher explaining (An et al., 2021). Of course, this problem will disrupt teaching and learning activities. Because calm in the classroom during teaching and learning activities also influences the teacher in providing and explaining the material (Sayaf et al., 2022; H. Shen et al., 2021). If class conditions are not conducive then the material explained will not be optimally accepted and mastered by students. According to Mpungose & Khoza (2022), students' wrong behavior is caused by motives, seeking attention, satisfaction, the desire to lead or dominate others, revenge for past mistakes, discouragement or low self-esteem and many other behaviors.

In the development of a new era in the world of education, there is a need for educational reform which is closely related to the information systems needed in the development of the world of education. According to Sayaf et al. (2022), this concept has nuances about how the world of education tries to use computer devices, which can be applied as a means of communication to significantly improve the performance of the world of education. By implementing this new reform in the information system, it is hoped that in the future the world of education will not be left behind by the times in its technological developments and will continue to strive for better educational success (Ghizlane et al., 2019; Mokmin & Rassy, 2024; Owolabi & Bekele, 2021).

However, increasing self-awareness and strengthening learning in the future requires information systems and information technology that not only function as supporting educational success, but as the main factor in supporting the world of education so that it is able to compete in the global market (Espino et al., 2023; Mokmin & Rassy, 2024). With the knowledge gained, educational institutions have come up with new concepts and strategies in providing services to educational service users which are then applied in practice by several educational institutions that have the opportunity to utilize these concepts and strategies. Furthermore, the application of management information systems in educational institutions functions as a tool to assist decision makers and by other parties who are members of the inter-organizational information system so that educational organizations can interact with interested parties (Camilleri & Camilleri, 2022; Hua et al., 2019). The development of management information systems in educational institutions is very much needed, because in facing global competition educational institutions are required to provide information more quickly, accurately and conveniently which is part of service quality, so that it will become a competitive advantage.

At MA Darul Huda Mayak, in order to increase students' self-awareness and strengthen learning, the school uses an action card system where the action cards aim to control students in carrying out learning, because before the existence of the action card system the school still had difficulty in controlling learning activities, and after the existence of the system. These action cards can control student learning activities and increase awareness and reinforcement of

learning at MA Darul Huda. The action card program has been running for approximately 3 years at MA Darul Huda Mayak Tonatan Ponorogo, which previously used magic cards, namely those with the same function for permission to leave class and record violations committed. However, it was felt to be less effective in its implementation because the book was often forgotten to bring and the model was not updated because it could not be accessed via the internet (Ghizlane et al., 2019; H. Shen et al., 2021).

Therefore, in line with technological developments, MA Darul Huda Mayak Tonatan Ponorogo replaced policies through a management information system using action cards which were deemed more practical and efficient in use, the application was developed by the MA Darul Huda Mayak Tonatan Ponorogo institution itself. The advantage of the action card is that its implementation is more efficient and easily accessible to all teachers when students commit violations in the madrasa environment, therefore the action card will make supervision easier for students (Hampshire et al., 2022; Tseng, 2020). Furthermore, with the implementation of action cards, the level of student discipline is increasing, because every violation committed will receive its own score and sanctions from the madrasah.

According to Masaeid et al. (2022), implementing a competency-based management information system is an absolute necessity and can provide a competitive advantage so that it receives high priority. Good management or management in an educational institution is absolutely essential for the survival of that institution. One of the important things that can maintain and even develop an educational institution is the proper management of information systems (Andriotis & Papakonstantinou, 2019; Murray & Howe, 2017). This area is completely digital and easy to access, quickly understood, discipline is applied to understanding management information systems which can help school institutions to achieve their educational goals in a better direction starting from student discipline and the development of information technology knowledge, information and communication, scientific progress in various fields, for example in the business world or exclusively educational organizations (Al-Ansi & Fatmawati, 2023; Baduge et al., 2022). The presence and role of information technology has ushered in a new era in educational development, but it has not been balanced with more human resources.

In the implementation at MA Darul Huda Mayak Tonatan Ponorogo, it was found that approximately 70% of students had shown activeness in learning in the madrasa environment, by obeying all existing regulations and not breaking them. The environmental conditions of MA Darul Huda Mayak Tonatan Ponorogo itself have a very large quantity of students, where supervision carried out by the institution in teaching and learning activities to increase activity and improve learning must be carried out well. Therefore, the MA Darul Huda Mayak Tonatan Ponorogo institution utilizes a management information system and action card system to increase student activity and improve student learning. So the hope is that the action card system can work quickly and accurately so that work productivity in educational institutions increases and has an impact on increasing activity and improving student learning in the madrasa environment (Audia et al., 2021; Ghizlane et al., 2019). Therefore, it is very important to conduct an in-depth study regarding the extent of the impact of student self-awareness in mediating the MIS and action card system on strengthening learning.

METHOD | منهج

Research Design and Participants

This research utilizes a quantitative approach with ex-post facto methods to retrospectively examine teacher performance variables. An explanatory and correlational design is employed, using Partial Least Squares Structural Equation Modeling (PLS-SEM) to explore relationships within a conceptual model. PLS-SEM, a multivariate statistical method, analyzes the connections between latent or measured variables, enabling a comprehensive understanding of cause-and-effect and correlational relationships. The study uses probability sampling with random sampling techniques, involving 64 grade 12 Islamic religious education students at MA Darul Huda Ponorogo.

Measures

Table 1. Research Variable Construct

No	Variable	Indicators	Construct	References
1	Management Information System (X1)	Efficiency of application use	MIS1	(Al-Ansi & Fatmawati, 2023; Camilleri & Camilleri, 2022; Masaeid et al., 2022; Mpungose & Khoza, 2022; Owolabi & Bekele, 2021)
2		Effective and flexible	MIS2	
3		Delays in the system	MIS3	
4		System consistency	MIS4	
5		Accessing a site	MIS5	
6		Fast to design	MIS6	
7		Easy to use	MIS7	
8		Processing standards	MIS8	
9		Storage standards	MIS9	
10	Action Card System (X2)	Obey every regulation	ACS1	(Audia et al., 2021; Harriman et al., 2019; Meng-Yang, 2022; H. Shen et al., 2021; Taddio et al., 2019; Tan et al., 2018; Tseng, 2020; Yajima & Takahashi, 2017)
11		Easy to understand rules	ACS2	
12		Improving quality	ACS3	
13		Have enough support	ACS4	
14		Lack of motivation	ACS5	
15		Lack of skills	ACS6	
16		Lack of time	ACS7	
17		Health factors	ACS8	
18		Effective method	ACS9	
19	Self-Awareness (Z)	Handling similar situations	SA1	(Barzel et al., 2019; Blackmore et al., 2021; Espino et al., 2023; Garcia-Ortega & Galan-Cubillo, 2021; Xu, 2022)
20		New challenges	SA2	
21		Personal development	SA3	
22		Sufficient attention	SA4	
23		Setting priorities	SA5	
24		Quality of life	SA6	
25		Future	SA7	
26		Managing finances	SA8	
27		Personal life and career	SA9	
28	Reinforcement Learning (Y)	Positive class	RL1	(Andriotis & Papakonstantinou, 2019; Chen et al., 2020; Freedman et al., 2019; Zagel et al., 2019)
29		The role of classmates	RL2	
30		Teaching methods	RL3	
31		Teacher support	RL4	
32		Consistent factors	RL5	
33		Personal skills	RL6	
34		Self-reflection	RL7	
35		Specific techniques	RL8	

The data collection technique used in this research is a four-variable questionnaire. Research design with an explanatory and correlational approach to determine the relationship between independent (Management Information System and Action Card System), mediation (Self-Awareness), and dependent (Reinforcement Learning). Data collection was carried out using a survey method via Google Forms. This research uses a Likert scale consisting of 4 alternative answers from strongly agree to strongly disagree (Daryono et al., 2020; Widyastuti et al., 2023). Research instrument variables are shown in Table 1.

Data Analysis

Statistical analysis of this research uses the PLS-SEM measurement technique. The outer model testing stage is a measurement model testing stage that aims to prove the validity and estimate the reliability of indicators and constructs. Several requirements that must be met are the indicator loading factor (λ >0.70), and the reflective construct AVE (>0.50) (Daryono et al., 2024; Fauzan et al., 2023; Supriyanto et al., 2022). Reliability estimates use cronbach Alpha, Rho_A, and CR values (>0.70). The goodness of fit model testing stage aims to test the predictive power of the model and the feasibility of the model. The criteria that must be met include predictive relevance to see the predictive power of the model on the blindfolding output (Daryono et al., 2023; Hariyanto et al., 2022). The inner model testing stage is to test the significance of the direct (H-DIR$_{1-5}$) and indirect effects (the mediating role of H-IND$_{1-2}$).

RESULT | نتائج

Evaluation of Measurement Models

Evaluation of measurement models is very important to ensure that the indicators used to measure latent constructs or variables are by the research objectives and have good quality. Examining construct validity is the primary goal of measuring model evaluation. Analysing the relationship between the indicator and the measured construct can ensure that the indicator truly reflects the intended aspect of the construct. By analyzing factor loadings, reliability, and discriminant validity, researchers can decide which indicators should be included in the analysis and which should be omitted.

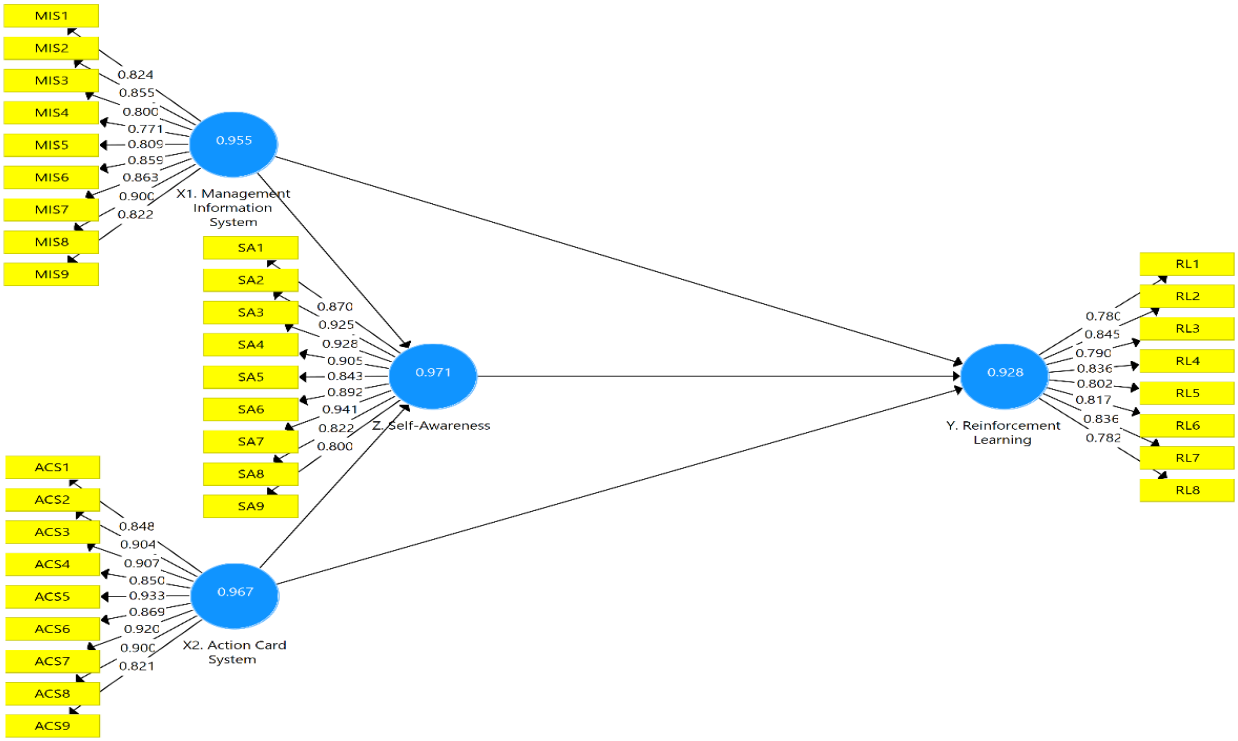

Figure 1. Testing the Measurement Model (Outer Model)

Based on **Table 2**, the value obtained from the overall factor loading in each sub-variable is >0.70 (0.771-System Consistency to 0.941-Future). This means that the level of relationship between sub-variables and variables that can be explained is 77.10% to 94.10%. The Average

Extracted Variance (AVE) value for each variable obtained a value of >0.50 (0.696- Management Information System (X1) to 0.778-Learning Reinforcement (Y). So it can be concluded that each sub-variable and variable in the instrument in the research model is relevant with convergent validity requirements. In the Management Information System variable (X1), the highest value in measuring Learning Reinforcement (Y) is Construct X1.8 (0.900) in the "Processing Standard" sub variable so that the Processing Standard sub variable can measure the success of the System variable Management Information is 90.00%, while the weakest sub variable is X1.4 in the "System Consistency" sub variable with a value of (0.771 or 77.10%).

Table 2. Validity and Consistency Reliability test results

No	Variable	Construct	Conver Validity		Consistency Reliability		
			FL (>0.70)	AVE (>0.50)	CA (>0.70)	Rho A (>0.70)	CR (>0.70)
1	Management Information System (X1)	MIS1	0.824	0.696	0.946	0.955	0.954
2		MIS2	0.855				
3		MIS3	0.800				
4		MIS4	0.771				
5		MIS5	0.809				
6		MIS6	0.859				
7		MIS7	0.863				
8		MIS8	0.900				
9		MIS9	0.822				
10	Action Card System (X2)	ACS1	0.848	0.782	0.965	0.967	0.970
11		ACS2	0.904				
12		ACS3	0.907				
13		ACS4	0.850				
14		ACS5	0.933				
15		ACS6	0.869				
16		ACS7	0.920				
17		ACS8	0.900				
18		ACS9	0.821				
19	Self-Awareness (Z)	SA1	0.870	0.658	0.926	0.928	0.939
20		SA2	0.925				
21		SA3	0.928				
22		SA4	0.905				
23		SA5	0.843				
24		SA6	0.892				
25		SA7	0.941				
26		SA8	0.822				
27		SA9	0.800				
28	Reinforcement Learning (Y)	RL1	0.780	0.778	0.964	0.971	0.969
29		RL2	0.845				
30		RL3	0.790				
31		RL4	0.836				
32		RL5	0.802				
33		RL6	0.817				
34		RL7	0.836				
35		RL8	0.782				

The results of the SmartPLS Output in Table 5 show that all constructions have CA values (0.965- Action Card System (X2) to 0.946- Management Information System (X1)), rho_A (0.967-Action Card System (X2) to 0.955- Management Information System (X1), and CR (0.970-Action Card System (X2) to 0.954-Management Information System (X1) as a whole, namely >0.70.) It can be concluded that all research variables have good reliability in measuring Learning Reinforcement (Y).

The Fornell-Larcker test is one of the methods used in Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the discriminant validity of the constructs in a model. This test aims to ensure that the different constructs in the model can be distinguished from each other. This is done by comparing the variance explained by the construct with the variance explained by other constructs in the model. If the variance explained by a construct is greater than the variance explained by another construct, then the construct has good discriminant validity. Based on Table 3 in the Fornell-Larcker test, the correlation value of Management Information System (X1) → Management Information System (X1) has a value of 0.834, which is greater than the correlation value of Management Information System (X1) with other variables (Action Card System → 0.177; Awareness Self → 0.373; and Reinforcement of Learning → 0.124). And so on for assessing correlation with other variables.

Table 3. Discriminant Validity: Fornell Larcker

Variables	X1	X2	Z	Y
X1. Management Information System	0.834			
X2. Action Card System	0.177	0.884		
Z. Self-Awareness	0.373	0.532	0.811	
Y. Reinforcement Learning	0.124	0.819	0.572	0.882

One of the main purposes of HTMT testing is to measure discriminant validity in the model. HTMT is used to examine the extent to which the constructs measured by different indicators represent the same or different constructs in the model. HTMT is also useful for assessing multicollinearity between constructs in the model. Multicollinearity can occur when constructs are strongly related to each other, which can cause problems in the estimation and interpretation of results in SEM analysis. Table 4 shown the HTMT testing for all dimensions has a value <0.90 (0.146 to 0.596). So, it can be concluded that Fornell-Larcker and HTMT on the correlation of all variables in this research data instrument meet the requirements of the discriminant validity test in measuring the success of Learning Reinforcement (Y)

Table 4. Discriminant Validity: Heterotrait-Monotrait ratio (HTMT)

Variables	X1	X2	Z	Y
X1. Management Information System				
X2. Action Card System	0.146			
Z. Self-Awareness	0.380	0.557		
Y. Reinforcement Learning	0.131	0.837	0.596	

Structural Model Testing (Inner Model)

Structural evaluation in testing on PLS-SEM has the main objective, namely to assess the prediction accuracy of the proposed model. This is done by evaluating the extent to which the model is able to explain variations in empirical data and predict endogenous variables well. Overall, structural evaluation aims to improve understanding of the phenomenon studied in the research context. By analyzing the relationships between variables, researchers can identify the factors that contribute to the phenomenon and develop deeper insight into the dynamics involved.

Table 5 on the Learning Reinforcement (Y) variable obtained an R2 value of 0.430. This means that the four variables measuring Learning Strengthening together have an influence of 43.00% and the remaining 57.00% is influenced by other variables outside the research model. Furthermore, the Self Awareness (Z) variable obtained an R2 value of 0.671. This means the four

variables measuring Self Awareness (X1, X2, Y, Z) together they have an influence of 67.10 which is categorized as a large influence (>67.00%) and the remaining 32.90% is influenced by other variables outside the research model.

Table 5. Coefficient of Input (R2) test results

Variables	R Square	Percentage (%)	Decision
Y. Reinforcement Learning	0.430	43.00%	Substantial
Z. Self-Awareness	0.671	67.10%	Substantial

Path Analysis and Hypothesis testing

One of the main goals of hypothesis testing is to examine the relationships between variables in a proposed model. This is done by analyzing the strength and significance of the relationships between the variables identified in the model. Direct effect evaluation allows researchers to test the consistency between empirical findings and the theory that supports the model. Furthermore, this test analyzes the significance of the mediation effect in the research model. This is important for understanding the mechanisms underlying relationships between variables and how certain variables can mediate or change relationships between other variables.

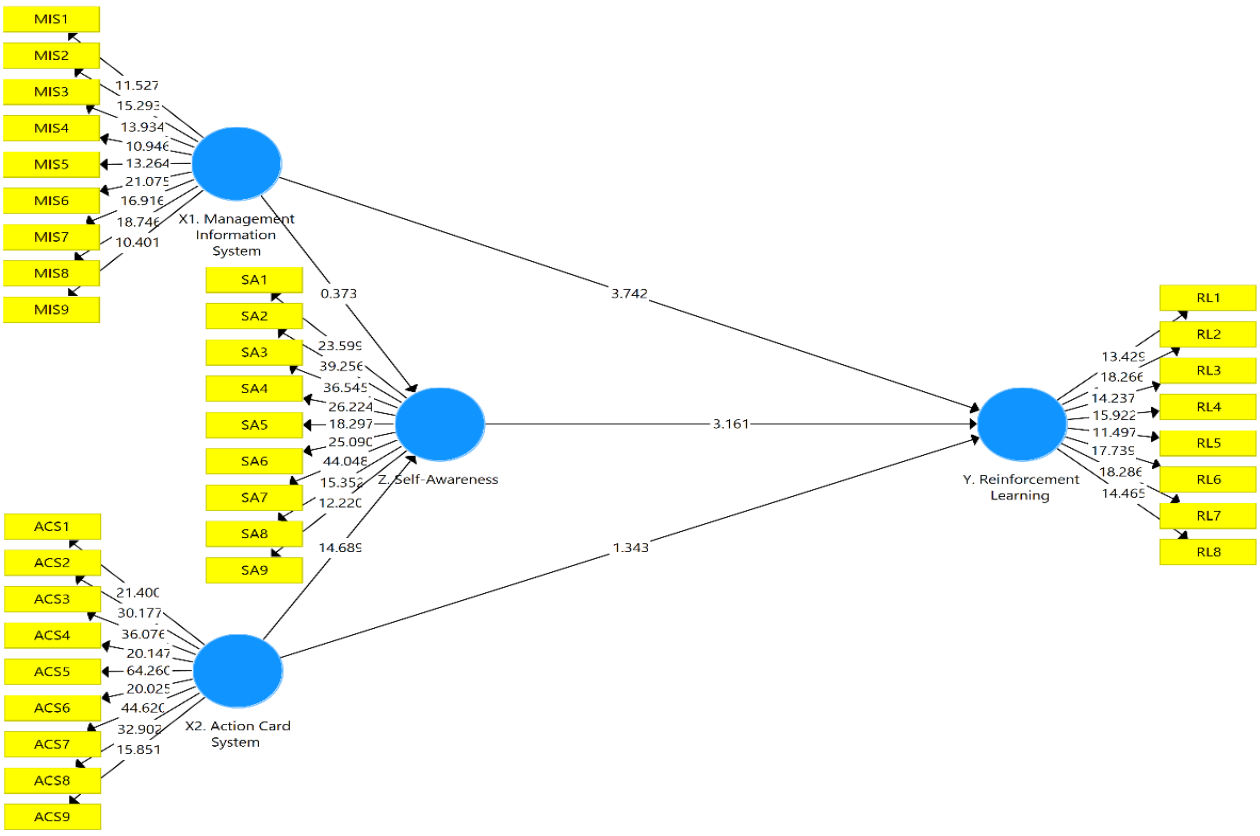

Figure 2. Evaluation of Path Analysis

Based on Table 6, a hypothesis can be accepted with significant criteria if it has a $T_{statistics}$ value above 1.96. Meanwhile, the hypothesis can be accepted with a positive or negative influence if the β_{value} coefficient results indicate a positive or negative direction of influence. In hypothesis H2 (Management Information Systems (X1) → Reinforcement of Learning (Y) obtained β_{values} = 0.304 (positive decimal), $T_{statistics}$ = 3.967 (>1.96) and ρ_{values} = 0.000 (<0.05). This shows that the Management Information System variable (X1) has a positive and significant

effect on Strengthening Learning (Y). It can be concluded that the data for these two variables accepts the hypothesis (Hypothesis 2 is accepted). This can be interpreted that when the Management Information System variable (X1) increases, the Learning Strengthening variable (Y) will also increase and vice versa.

Table 6. Direct Hypothesis Testing (Direct Effects)

Hyp.	Variables	β-values (+/-)	Sample Mean	T-statistics (>1.96)	P-values (<0,05)	Decision
H1	X1. MIS → Z. SA	0.028	0.032	0.406	0.685	Rejected
H2	X1. MIS → Y. RL	0.304	0.321	3.967	0.000	Accepted
H3	X2. ACS → Z. SA	0.815	0.822	15.111	0.000	Accepted
H4	X2. ACS → Y. RL	0.178	0.174	1.324	0.186	Rejected
H5	Z. SA → Y. RL	0.389	0.380	3.252	0.001	Accepted

In hypothesis H4 (Action Card System (X2) → Learning Reinforcement (Y) the values obtained are $\beta\text{-}_{values}$ = 0.178 (positive decimal), $T\text{-}_{statistics}$ = 1.324 (>1.96) and $\rho\text{-}_{values}$ = 0.186 (<0.05). This shows that the Action Card System variable (X2) has a positive but not significant effect on Strengthening Learning (Y). It can be concluded that the data for these two variables reject the hypothesis (Hypothesis 4 is rejected). This can be interpreted that when the Card System variable If action (X2) increases, the variable Strengthening Learning (Y) will decrease and vice versa. The biggest influence on the variable Strengthening Learning (Y) is the positive and significant influence of the Student Self-Awareness variable (Z) which has a $\beta\text{-}_{value}$ of 0.389, and the influence of the Management Information System variable (X1) which obtained $\beta\text{-}_{values}$ of 0.304. Meanwhile, the smallest influence was the Action Card System variable (X2) which obtained $\beta\text{-}_{values}$ of 0.178.

Analysis of Indirect Relationships (Moderation) (Indirect Effects)

In Hypothesis H-IND2, the results of testing the moderating effect of the Student Self-Awareness variable (Z) can be concluded that there is a positive ($\beta\text{-}_{values}$ = 0.317) and significant ($T\text{-}_{statistics}$ 2.977 > 1.96 and $\rho\text{-}_{values}$ = 0.003 < 0.05) influence between Action Card System (X2) towards Strengthening Learning (Y). So, H-IND2 which states "There is a positive and significant influence between the Action Card System (X2) and Student Self-Awareness (Z) to increase Learning Strengthening (Y) at MA Darul Huda" can be accepted. It can be seen that the direct effect (Direct Effects) on hypothesis H-DIR4 is that the Action Card System (X2) on Strengthening Learning (Y) has a positive but not significant effect with $\beta\text{-}_{values}$ = 0.178. So, the $\beta\text{-}_{values}$ between H-IND2 for Indirect Effects are greater than H4 for Direct Effects. It can be concluded that the mediator role in the Student Self-Awareness variable (Z) is needed to increase the influence of the Action Card System variables (X2) on Strengthening Learning (Y).

In Hypothesis H-IND1, the results of testing the moderating effect of the Student Self-Awareness variable (Z) can be concluded that there is a positive influence ($\beta\text{-}_{values}$ = 0.011) but not significant ($T\text{-}_{statistics}$ 0.392 > 1.96 and $\rho\text{-}_{values}$ = 0.696 < 0.05) between Management Information Systems (X1) and Strengthening Learning (Y). So, H-IND1 which states "There is a positive and significant influence between the Management Information System (X1) and Student Self-Awareness (Z) to increase Learning Strengthening (Y) at MA Darul Huda" cannot be accepted. It can be seen that the direct effect (Direct Effects) on hypothesis H-DIR2 is that the Management Information System (X1) on Strengthening Learning (Y) has a positive and significant influence with $\beta\text{-}_{values}$ = 0.304. So, the $\beta\text{-}_{values}$ between H-IND2 for Indirect Effects are smaller than H-DIR4 for Direct Effects. It can be concluded that the role of mediator in the Student

Self-Awareness variable (Z) is not really needed to increase the influence of the Management Information System variables (X1) on Strengthening Learning (Y).

Table 7. Indirect Hypothesis Testing (Indirect Effects)

Hyp.	Variables	β-values (+/-)	SDV	T-statistics (>1.96)	P-values (<0,05)	Decision	Mediating Role
H-INDI1	X1. MIS → Z. SA→ Y. RL	0.011	0.028	0.392	0.696	Rejected	No Mediation
H-INDI2	X1. ACS → Z. SA → Y. RL	0.317	0.106	2.977	0.003	Accepted	Full Mediation

DISCUSSION | مناقشة

The results of testing the H1 hypothesis show that the $T_{statistics}$ value of 0.406 is not significant because the $T_{statistics}$ value is >1.96, so the first hypothesis is rejected. The management information system (MIS) does not have much influence on students' self-awareness. This research is in line with Al-Ansi & Fatmawati (2023) which states that when students have too much information or too much focus on data it can result in excessive stress and anxiety for students. Therefore, it is important to consider the balance between the use of MIS and interpersonal support in the development of students' self-awareness (Camilleri & Camilleri, 2022; Masaeid et al., 2022). Management information systems help improve the quality of student learning experiences. This can include interactive learning materials, multimedia content, and other learning aids that can be tailored to individual needs and learning styles (Owolabi & Bekele, 2021; Sayaf et al., 2022). Management information systems enable the provision of more personalized learning by analyzing data about students' learning progress, interests and individual needs. By better understanding students' learning profiles, teachers can design more relevant and effective learning experiences.

The action card system is an important factor in increasing students' self-awareness. The action card system is closely related to student self-awareness because monitoring the action card system can increase the awareness within students. This research is in line with Audia et al. (2021) which states that self-awareness is included in the emotional realm, so in controlling an emotion there needs to be a system or a rule that requires controlling that emotion. The action card system allows systematic monitoring of learning progress (Hampshire et al., 2022; Meng-Yang, 2022). By recording the actions taken and the results, students and teachers can see the progress of learning over time. This helps identify areas where progress has been made and where improvements are still needed. The action card system encourages the development of independent skills in students by encouraging them to take the initiative in improving their own understanding. By recording actions taken and identifying effective strategies, students learn to better manage their own learning.

The action card system can have a good influence on strengthening learning when assisted by student self-awareness. This statement is in line with Ghizlane et al. (2019) which states that student self-awareness can help increase the reinforcement of supervised learning with the action card system, helping students to better understand their own feelings and needs. In this case, students will be more sensitive to their surrounding environment and become more empathetic towards their classmates. In this way, students will focus more on learning and easily understand the material provided (Audia et al., 2021; Harriman et al., 2019; Tan et al., 2018; Yajima & Takahashi, 2017).

Student self-awareness is a factor that can influence the strengthening of student learning. This statement is supported by Barzel et al. (2019) stating that self-awareness has an important influence on strengthening student learning. Students who have awareness of their learning can study diligently and listen to the teacher explaining the lesson. There is an influence between self-concept and student learning outcomes, students who have an awareness of their learning seriously can create enthusiasm and motivation to achieve, and with a strong sense of self-confidence, students no longer fall asleep or listen to what the teacher gives. However, this research is not in line with Espino et al. (2023) which states that student self-awareness will have a negative impact on strengthening learning because this will result in students becoming lazy about studying, high anxiety in doing assignments, low self-efficacy regarding learning, and a feeling of quickly giving up on learning.

However, this research is not in line with Masaeid et al. (2022) which states that management information systems have an influence on student self-awareness because management information systems are very necessary to improve the quality of student self-awareness. The role of information systems and technology greatly determines the success of a student today. This is because nowadays everything is always related to technology and information systems. Self-awareness helps students to regulate themselves in terms of the time, effort, and attention they give to learning (Fernandez-Perez & Martin-Rojas, 2022; Garcia-Ortega & Galan-Cubillo, 2021). By being aware of their own needs and preferences, students can develop effective study routines and allocate resources wisely. Student self-awareness is a key element in strengthening learning. By increasing students' self-awareness, educational institutions can create an environment that supports, motivates, and encourages sustainable learning growth and development (Garcia-Ortega & Galan-Cubillo, 2021; Lynch, 2017).

Self-awareness mediation has an important role in managing the influence of management information systems. With high self-awareness, individuals can more easily understand the information presented by management information systems and make appropriate decisions based on their understanding of that information (Lynch, 2017; Xu, 2022). Furthermore, self-awareness mediation also plays a role in influencing the use of the action card system. With good self-awareness, individuals can more easily evaluate the action cards they receive and take actions that align with their goals.

Self-awareness also helps individuals to be more effective in planning and carrying out the actions necessary to achieve their goals (Barzel et al., 2019). The mediating role of self-awareness on the influence of management information systems and action card systems on learning is key in helping students understand their progress, identify their learning needs, and develop effective learning strategies. Self-awareness provides a framework for deep self-reflection, allowing students to integrate information from both systems and take appropriate steps to improve their academic performance. The mediating role of self-awareness on the influence of the Action Card System (ACS) on strengthening learning lies in its ability to help students understand and evaluate the steps taken to improve their understanding (Audia et al., 2021; Freedman et al., 2019; Ghizlane et al., 2019; Taddio et al., 2019). In addition, ACS can assist students in planning further actions that suit individual learning needs. With strengthened self-awareness, students can more effectively use ACS as a tool to develop self-regulation skills, improve academic progress, and achieve optimal learning outcomes.

CONCLUSSION | خاتمة

The Action Card System variable is an important factor in increasing students' self-awareness. The Action Card System is closely related to Student Self-Awareness because monitoring the Action Card System can increase the awareness within students. Self-awareness is included in the emotional realm, so in controlling an emotion there is a need for a system or a rule that requires controlling that emotion. Student Self-Awareness is a factor that can influence the Strengthening of Student Learning. Self-awareness has an important influence on strengthening student learning. Students who have awareness of their learning can study diligently and listen to the teacher explaining the lesson. There is an influence between self-concept and student learning outcomes, students who have an awareness of their learning seriously can create enthusiasm and motivation to achieve, and with a strong sense of self-confidence, students no longer fall asleep or listen to what the teacher gives. Student Self-Awareness has a positive influence in mediating the Card System on Strengthening Learning. Because it can help students to better understand their own feelings and needs. In this case, students will be more sensitive to their surrounding environment and become more empathetic towards their classmates. In this way, students will focus more on learning and easily understand the material provided.

BIBLIOGRAPHY | مراجع

Al-Ansi, A. M., & Fatmawati, I. (2023). Integration of ICT in higher education during COVID-19 pandemic: A case study. *International Journal of Learning and Change*, *15*(4), 430–442. https://doi.org/10.1504/IJLC.2023.132132

An, Y., Kaplan-Rakowski, R., Yang, J., Conan, J., Kinard, W., & Daughrity, L. (2021). Examining K-12 teachers' feelings, experiences, and perspectives regarding online teaching during the early stage of the COVID-19 pandemic. *Educational Technology Research and Development*, *69*(5), 2589–2613. https://doi.org/10.1007/s11423-021-10008-5

Andriotis, C. P., & Papakonstantinou, K. G. (2019). Managing engineering systems with large state and action spaces through deep reinforcement learning. *Reliability Engineering & System Safety*, *191*(1), 1–16. https://doi.org/10.1016/j.ress.2019.04.036

Apriliani, F. D., Widihastuti, Daryono, R. W., Jaya, D. J., & Rizbudiani, A. D. (2023). The Influence of Fashion Knowledge, Fashion Selection Factor, and Dress Etiquette on Dress Look. *Jurnal Pendidikan Dan Pengajaran*, *56*(1), Article 1. https://doi.org/10.23887/jpp.v56i1.53677

Audia, C., Yatri, I., Aslam, Mawani, S., & Zulherman. (2021). Development of Smart Card Media for Elementary Students. *Journal of Physics: Conference Series*, *1783*(1), 1–12. https://doi.org/10.1088/1742-6596/1783/1/012114

Baduge, S. K., Thilakarathna, S., Perera, J. S., Arashpour, M., Sharafi, P., Teodosio, B., Shringi, A., & Mendis, P. (2022). Artificial intelligence and smart vision for building and construction 4.0: Machine and deep learning methods and applications. *Automation in Construction*, *141*(2), 1–14. https://doi.org/10.1016/j.autcon.2022.104440

Barzel, B., Ball, L., & Klinger, M. (2019). Students' Self-Awareness of Their Mathematical Thinking: Can Self-Assessment Be Supported Through CAS-Integrated Learning Apps on Smartphones? In G. Aldon & J. Trgalová (Eds.), *Technology in Mathematics Teaching: Selected Papers of the 13th ICTMT conference* (Vol. 2, pp. 75–91). Springer International Publishing. https://doi.org/10.1007/978-3-030-19741-4_4

Blackmore, C., Vitali, J., Ainscough, L., Langfield, T., & Colthorpe, K. (2021). A Review of Self-Regulated Learning and Self-Efficacy: The Key to Tertiary Transition in Science, Technology, Engineering and Mathematics (STEM). *International Journal of Higher Education*, *10*(3), 169–177.

Camilleri, M. A., & Camilleri, A. C. (2022). The Acceptance of Learning Management Systems and Video Conferencing Technologies: Lessons Learned from COVID-19. *Technology, Knowledge and Learning*, *27*(4), 1311–1333. https://doi.org/10.1007/s10758-021-09561-y

Chen, C.-L., Chang, M., Chang, H.-Y., Lin, C.-H., Li, K.-C., Kuo, R., & Wang, H. (2020). The Effectiveness of Giving Students In-Game Cards as Rewards. In J. Shen, Y.-C. Chang, Y.-S. Su, & H. Ogata (Eds.), *Cognitive Cities* (Vol. 25, pp. 306–315). Springer. https://doi.org/10.1007/978-981-15-6113-9_35

Daryono, R. W., Hariyanto, V. L., Usman, H., & Sutarto, S. (2020). Factor analysis: Competency framework for measuring student achievements of architectural engineering education in Indonesia. *REID (Research and Evaluation in Education)*, *6*(2), Article 2. https://doi.org/10.21831/reid.v6i2.32743

Daryono, R. W., Hidayat, N., Nurtanto, M., & Fu'adi, A. (2024). The development of a competency framework for architectural engineering graduates: Perspectives by the construction industry in Indonesia. *Journal of Technology and Science Education*, *14*(2), Article 2. https://doi.org/10.3926/jotse.1986

Daryono, R. W., Ramadhan, M. A., Kholifah, N., Isnantyo, F. D., & Nurtanto, M. (2023). An empirical study to evaluate the student competency of vocational education. *International Journal of Evaluation and Research in Education (IJERE)*, *12*(2), Article 2. https://doi.org/10.11591/ijere.v12i2.22805

Espino, E., Guarini, A., & Del Rey, R. (2023). Effective coping with cyberbullying in boys and girls: The mediating role of self-awareness, responsible decision-making, and social support. *Current Psychology*, *42*(36), 32134–32146. https://doi.org/10.1007/s12144-022-04213-5

Fauzan, A., Triyono, M. B., Hardiyanta, R. A. P., Daryono, R. W., & Arifah, S. (2023). The Effect of Internship and Work Motivation on Students' Work Readiness in Vocational Education: PLS-SEM Approach. *Journal of Innovation in Educational and Cultural Research*, *4*(1), Article 1. https://doi.org/10.46843/jiecr.v4i1.413

Fawait, A., Setyosari, P., Sulthoni -, & Ulfa, S. (2020). Identification of Factors Affecting of Character Education Program on High School Students' Self-Regulation Skills. *Journal for the Education of Gifted Young Scientists*, *8*(1), Article 1. https://doi.org/10.17478/jegys.683165

Fernandez-Perez, V., & Martin-Rojas, R. (2022). Emotional competencies as drivers of management students' academic performance: The moderating effects of cooperative learning. *The International Journal of Management Education*, *20*(1), 64–82. https://doi.org/10.1016/j.ijme.2022.100600

Freedman, T., Taddio, A., Alderman, L., McDowall, T., deVlaming-Kot, C., McMurtry, C. M., MacDonald, N., Alfieri-Maiolo, A., Stephens, D., Wong, H., & Boon, H. (2019). The CARD™ System for improving the vaccination experience at school: Results of a small-scale implementation project on student symptoms. *Paediatrics & Child Health*, *24*(Supplement_1), S42–S53. https://doi.org/10.1093/pch/pxz020

Garcia-Ortega, B., & Galan-Cubillo, J. (2021). Combining Teamwork, Coaching and Mentoring as an Innovative Mix for Self-Aware and Motivational Learning. Implementation Case in Teamwork Sessions in the Context of Practices in A Bachelor's Degree. *INTED2021 Proceedings*, *9*(3), 10582–10588. https://doi.org/10.21125/inted.2021.2219

Ghizlane, M., Reda, F. H., & Hicham, B. (2019). A Smart Card Digital Identity Check Model for University Services Access. *Proceedings of the 2nd International Conference on Networking, Information Systems & Security*, *156*, 1–4. https://doi.org/10.1145/3320326.3320401

Hampshire, K., Islam, N., Kissel, B., Chase, H., & Gundling, K. (2022). The Planetary Health Report Card: A student-led initiative to inspire planetary health in medical schools. *The Lancet Planetary Health*, *6*(5), 449–454. https://doi.org/10.1016/S2542-5196(22)00045-6

Hariyanto, V. L., Daryono, R. W., Hidayat, N., Prayitno, S. H., & Nurtanto, M. (2022). A framework for measuring the level of achievement of vocational students' competency of architecture education. *Journal of Technology and Science Education*, *12*(1), Article 1. https://doi.org/10.3926/jotse.1188

Harriman, D., Singla, R., & Nguan, C. (2019). The Resident Report Card: A Tool for Operative Feedback and Evaluation of Technical Skills. *Journal of Surgical Research*, *239*, 261–268. https://doi.org/10.1016/j.jss.2019.02.006

Hua, H., Qin, Y., Hao, C., & Cao, J. (2019). Optimal energy management strategies for energy Internet via deep reinforcement learning approach. *Applied Energy*, *239*(4), 598–609. https://doi.org/10.1016/j.apenergy.2019.01.145

Lynch, D. (2017). Self-Evaluation: Building Student Self-awareness and Competence. *Proceedings of the Canadian Engineering Education Association (CEEA)*, *13*, 92–113. https://doi.org/10.24908/pceea.v0i0.10365

Masaeid, T. A., Alzoubi, H. M., Khatib, M. E., Ghazal, T. M., Alshurideh, M., Al-Dmour, N. A., & Sattar, O. (2022). Futuristic Design & Development of Learning Management System including Psychological Factors Resolution. *Journal for ReAttach Therapy and Developmental Diversities*, *5*(2s), Article 2s.

Meng-Yang. (2022). Student Card Consumption Behavior Based on Clustering Algorithm. In J. C. Hung, J.-W. Chang, Y. Pei, & W.-C. Wu (Eds.), *Innovative Computing* (Vol. 9, pp. 1591–1595). Springer Nature. https://doi.org/10.1007/978-981-16-4258-6_200

Mokmin, N. A. M., & Rassy, R. P. (2024). Review of the trends in the use of augmented reality technology for students with disabilities when learning physical education. *Education and Information Technologies*, *29*(2), 1251–1277. https://doi.org/10.1007/s10639-022-11550-2

Mpungose, C. B., & Khoza, S. B. (2022). Postgraduate Students' Experiences on the Use of Moodle and Canvas Learning Management System. *Technology, Knowledge and Learning*, *27*(1), 1–16. https://doi.org/10.1007/s10758-020-09475-1

Murray, K., & Howe, K. R. (2017). Neglecting democracy in education policy: A-F school report card accountability systems. *Education Policy Analysis Archives*, *25*(5), 109–109. https://doi.org/10.14507/epaa.25.3017

Owolabi, J., & Bekele, A. (2021). Implementation of Innovative Educational Technologies in Teaching of Anatomy and Basic Medical Sciences During the COVID-19 Pandemic in a Developing Country: The COVID-19 Silver Lining? *Advances in Medical Education and Practice*, *12*(3), 619–625. https://doi.org/10.2147/AMEP.S295239

Putra, K. A. J., Triyono, M. B., & Daryono, R. W. (2022). The Influence of Entrepreneurship Competency and Leadership Challenge to Principals' Leadership Solutions. *Jurnal Pendidikan Dan Pengajaran*, *55*(2), Article 2. https://doi.org/10.23887/jpp.v55i2.43711

Rodríguez-Jiménez, R.-M., Carmona, M., García-Merino, S., Díaz-Ureña, G., & Lara Bercial, P. J. (2022). Embodied Learning for Well-Being, Self-Awareness, and Stress Regulation: A Randomized Trial with Engineering Students Using a Mixed-Method Approach. *Education Sciences*, *12*(2), Article 2. https://doi.org/10.3390/educsci12020111

Sayaf, A. M., Alamri, M. M., Alqahtani, M. A., & Alrahmi, W. M. (2022). Factors Influencing University Students' Adoption of Digital Learning Technology in Teaching and Learning. *Sustainability*, *14*(1), Article 1. https://doi.org/10.3390/su14010493

Shen, H., Deng, W. H., Chattopadhyay, A., Wu, Z. S., Wang, X., & Zhu, H. (2021). Value Cards: An Educational Toolkit for Teaching Social Impacts of Machine Learning through Deliberation. *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, *132*, 850–861. https://doi.org/10.1145/3442188.3445971

Supriyanto, S., Munadi, S., Daryono, R. W., Tuah, Y. A. E., Nurtanto, M., & Arifah, S. (2022). The Influence of Internship Experience and Work Motivation on Work Readiness in Vocational Students: PLS-SEM Analysis. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, *5*(1), Article 1. https://doi.org/10.23917/ijolae.v5i1.20033

Taddio, A., Ilersich, A. N. T., Ilersich, A. L. T., Schmidt, C., Chalmers, G., Wilson, E., McMurtry, C. M., MacDonald, N., Bucci, L. M., Freedman, T., & Wong, H. (2019). Piloting The CARD™ System for education of students about vaccination: Does it improve the vaccination experience at school? *Paediatrics & Child Health*, *24*(Supplement_1), S35–S41. https://doi.org/10.1093/pch/pxz019

Tan, P., Wu, H., Li, P., & Xu, H. (2018). Teaching Management System with Applications of RFID and IoT Technology. *Education Sciences*, *8*(1), Article 1. https://doi.org/10.3390/educsci8010026

Tseng, Y.-C. (2020). How Design with Intent Cards Facilitate Behavioral Design Ideation for Humanities, Design, and Engineering Students. In P.-L. P. Rau (Ed.), *Cross-Cultural Design. User Experience of Products, Services, and Intelligent Environments* (Vol. 145, pp. 183–199). Springer International Publishing. https://doi.org/10.1007/978-3-030-49788-0_14

Widayanto, L. D., Soeharto, S., Sudira, P., Daryono, R. W., & Nurtanto, M. (2021). Implementation of the Education and Training Program seen from the CIPPO Perspective. *Journal of Education Research and Evaluation*, *5*(4), Article 4. https://doi.org/10.23887/jere.v5i4.36826

Widyastuti, P., Hadi, S., Daryono, R. W., & Samad, N. B. A. (2023). The Mediation Role of University Environment in the Relationship between Self-Efficacy and Family Environment on Entrepreneurial Education Interest: A PLS-SEM Approach. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, *5*(3), Article 3. https://doi.org/10.23917/ijolae.v5i3.22015

Xu, B. (2022). Influence of Childhood Emotions on Self-awareness and Growth Based on Satir's Iceberg Theory. *Journal of Psychology and Behavior Studies*, *2*(2), Article 2. https://doi.org/10.32996/jpbs.2022.2.2.1

Yajima, K., & Takahashi, S. (2017). Development of Evaluation System of AL Students. *Procedia Computer Science*, *112*(3), 1388–1395. https://doi.org/10.1016/j.procs.2017.08.056

Zagel, C., Grimm, L., & Luo, X. (2019). Method Cards – A New Concept for Teaching in Academia and to Innovate in SMEs. In T. Z. Ahram (Ed.), *Advances in Artificial Intelligence, Software and Systems Engineering* (Vol. 22, pp. 230–241). Springer International Publishing. https://doi.org/10.1007/978-3-319-94229-2_22