

**BUKTI KORESPONDENSI ARTIKEL PADA
JURNAL INTERNASIONAL BEREPUTASI**



PENGUSUL:

Sunawan, S.Pd., M.Si., Ph.D./NIDN 0001077804

UNIVERSITAS NEGERI SEMARANG

Yth. Penilai
Pada Usulan PAK

Bersama dengan surat ini, saya bermaksud menyertakan bukti bukti korespondensi proses artikel pada Jurnal Internasional dengan judul “Achievement Goals And Extraneous Load Predict Germane Load: The Mediating Effects Of Achievement Emotions”, yang dimuat pada Malaysian Journal of Learning and Instruction, edisi Vol. 18 No. 2, 31 Juli 2021, ISSN (p): 1675-8110, ISSN (e) : 2180-2483, halaman: 215–234.

Adapun susunan kronologi bukti korespondensi terdiri dari beberapa poin, pada tabel di bawah ini:

No	Tanggal	Aktivitas
1	28 April 2020	Submit artikel ke MJLI dengan no ID 9661
2	24 September 2020	Permintaan revisi dari editor
3	22 Oktober 2020	Resubmit hasil revisi artikel
4	24 November 2020	Menanyakan progres review
5	20 Desember 2020	Mendapatkan konfirmasi bahwa manuskrip masih dalam proses review
6	6 Januari 2021	Permintaan revisi yang ke-2
7	12 Januari 2021	Resubmit hasil revisi artikel yang ke-2
8	18 Februari 2021	Pemintaan revisi yang ke-3
9	15 Maret 2021	Resubmit hasil revisi artikel yang ke-3
10	29 April 2021	Pengumuman bahwa manuskrip diterima untuk dipublikasi pada vol. 18 (2) July 2021
11	20 Mei 2021	Melakukan pembayaran biaya publikasi

Demikian agar menjadi periksa.
Terima kasih.

Semarang, 2 Mei 2022

Hormat saya,

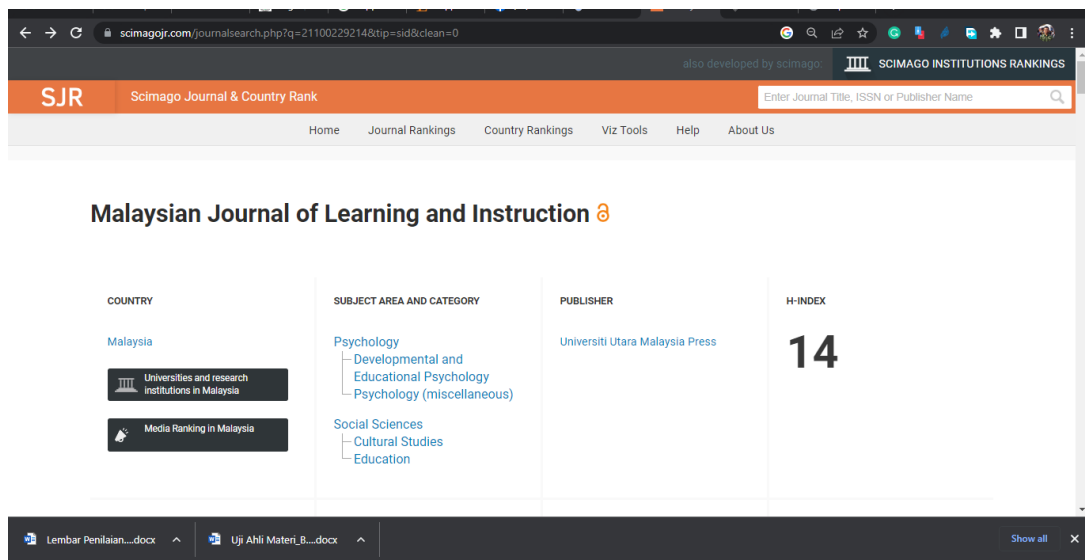


Sunawan

KRONOLOGI KORESPONDENSI PUBLIKASI ARTIKEL PADA JURNAL INTERNASIONAL BEREPUTASI DAN BERFAKTOR DAMPAK

Judul	: Achievement goals and extraneous load predict germane load: The mediating effects of achievement emotions
Jurnal	: Malaysian Journal of Learning and Instruction
Volume	: 18
Nomor	: 2
Tanggal publikasi	: 31 Juli 2021
ISSN (p)	: 1675-8110
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Hal	: 215–234
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SJR jurnal	: 0.286
Quartile	: Q1 (Scopus)
SNIP	: 0.965
Cite Score	: 2.5
Penulis	: Sunawan, Sugiyo, Yuli Kurniawati Sugiyo Pranoto

Bukti indexing jurnal:



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COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	H-INDEX
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SCOPE

The aims of the journal are to communicate research and stimulate discussion, study and critique of teaching and learning, and to encourage scholarly writing on learning and instruction. Coverage of MJLI includes, but is not limited to critical examination of ecosystems and issues surrounding the processes of meaningful teaching and learning and better educational practices. These could be addressed at micro level (e.g., innovative modes of delivery, instructional design and technology, learning engagement, instructional settings) or at macro level (e.g., motivation, engaging curriculum, impact of socio-psychological and cultural factors on learning). We welcome original empirical research articles with novel perspectives and/or methodological approaches that would appeal to an international readership. We do not accept unsolicited conceptual and theoretical papers.

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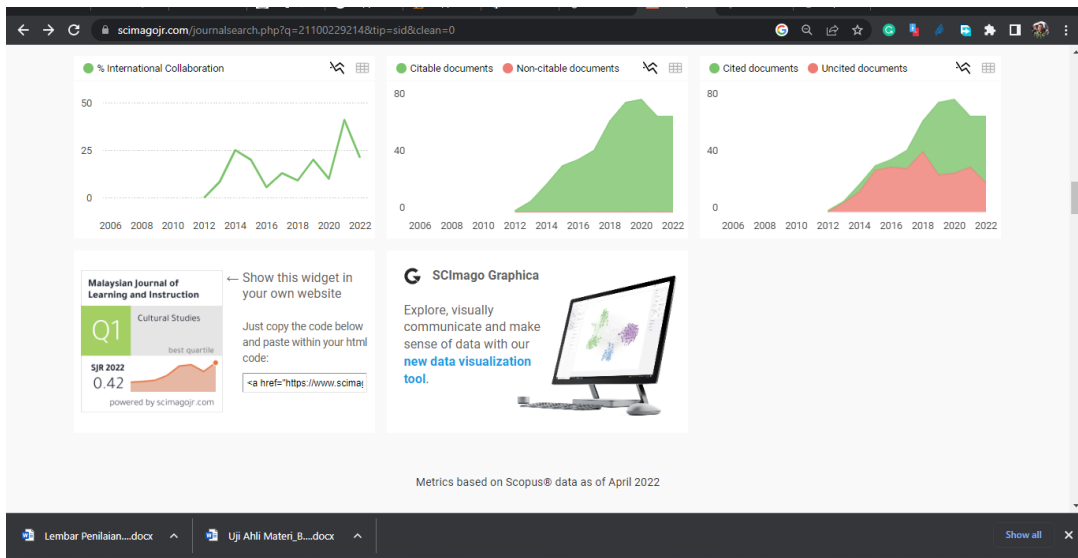
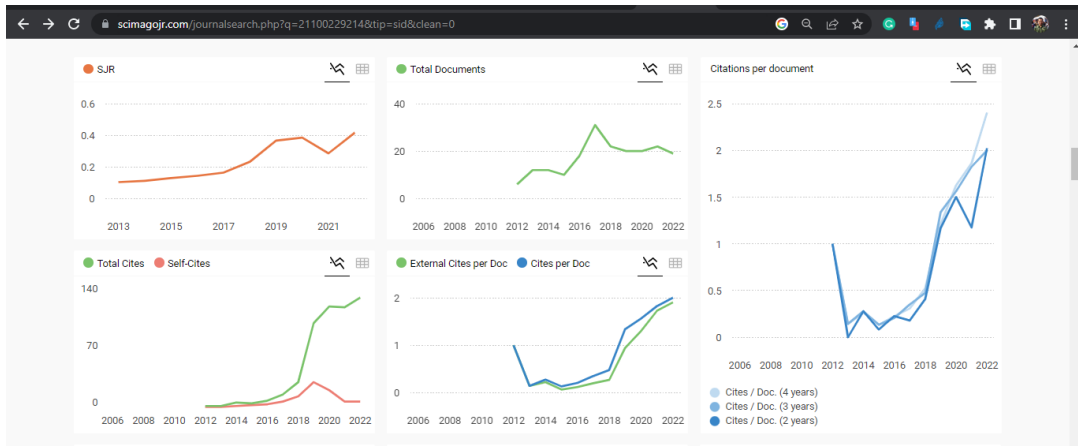
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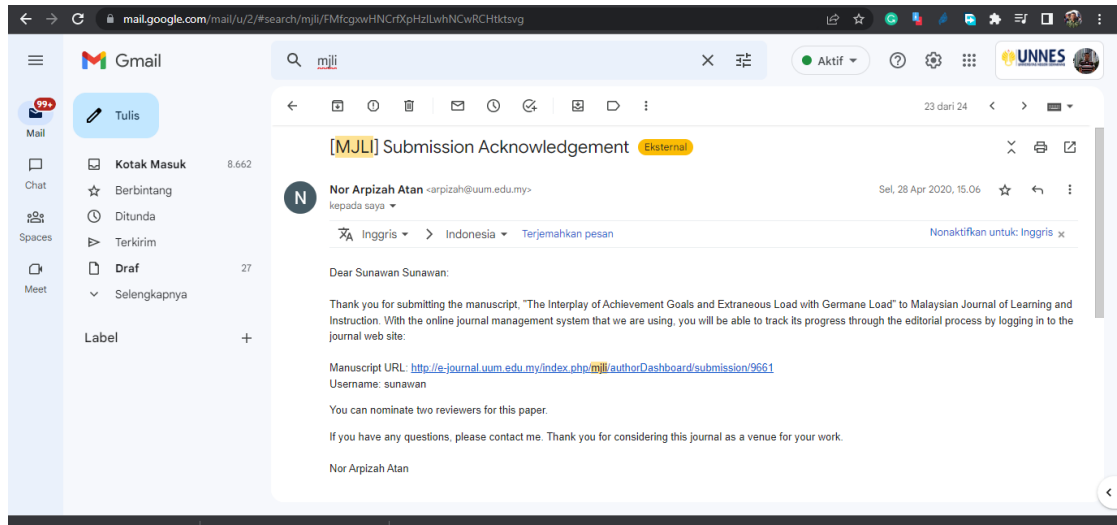
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Social Sciences		
Cultural Studies	#74/1127	93rd

1. Submit artikel ke MJLI dengan No. ID 9661



The screenshot shows a Gmail interface with a search for 'mjli'. The selected email is from Nor Arpizah Atan (norarpizah@uam.edu.my) dated April 28, 2020. The subject is '[MJLI] Submission Acknowledgement'. The email content is in Indonesian and includes the following text:

Dear Sunawan Sunawan:

Thank you for submitting the manuscript, "The Interplay of Achievement Goals and Extraneous Load with Germane Load" to Malaysian Journal of Learning and Instruction. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site.

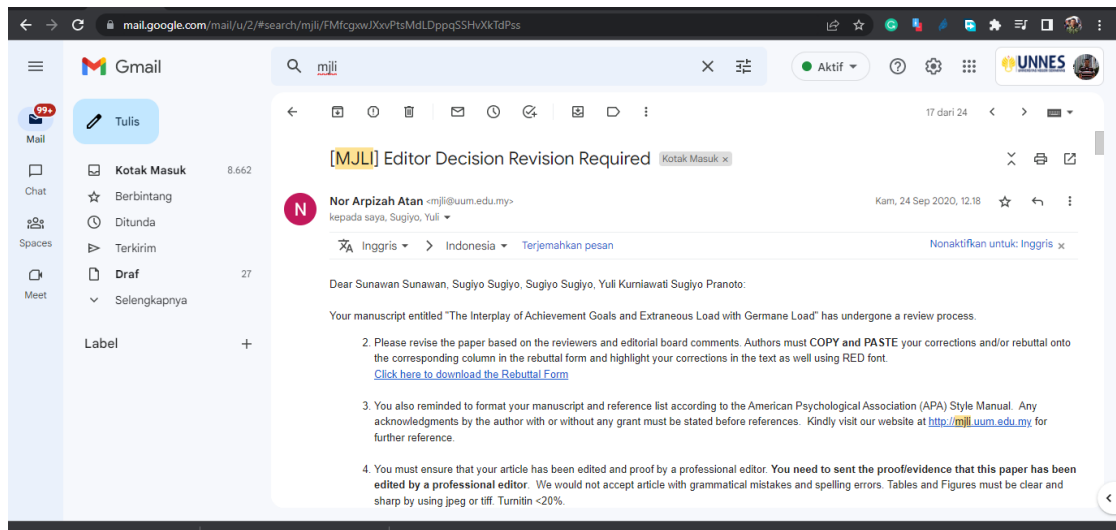
Manuscript URL: <http://e-journal.uam.edu.my/index.php/mjli/authorDashboard/submission/9661>
Username: sunawan

You can nominate two reviewers for this paper.

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Nor Arpizah Atan

2. Permintaan revisi dari editor



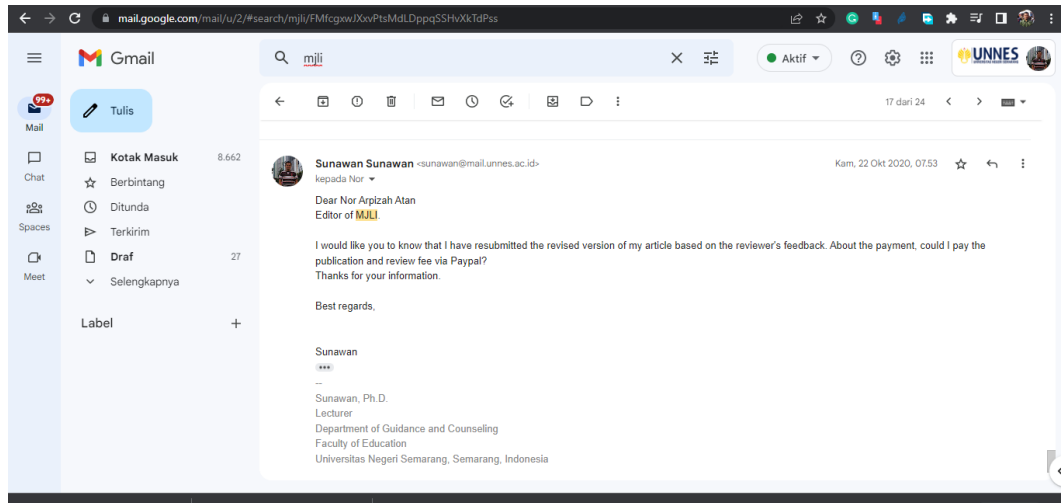
The screenshot shows a Gmail interface with a search bar containing 'mjli'. The email is from Nor Arpizah Atan (mjli@uum.edu.my) to the sender, dated September 24, 2020, at 12:18. The subject is '[MJLI] Editor Decision Revision Required'. The email content is as follows:

Dear Sunawan Sunawan, Suglyo Suglyo, Suglyo Suglyo, Yuli Kurniawati Suglyo Pranoto:

Your manuscript entitled "The Interplay of Achievement Goals and Extraneous Load with Germane Load" has undergone a review process.

2. Please revise the paper based on the reviewers and editorial board comments. Authors must **COPY and PASTE** your corrections and/or rebuttal onto the corresponding column in the rebuttal form and highlight your corrections in the text as well using RED font. [Click here to download the Rebuttal Form](#)
3. You also reminded to format your manuscript and reference list according to the American Psychological Association (APA) Style Manual. Any acknowledgments by the author with or without any grant must be stated before references. Kindly visit our website at <http://mjli.uum.edu.my> for further reference.
4. You must ensure that your article has been edited and proof by a professional editor. **You need to sent the proof/evidence that this paper has been edited by a professional editor.** We would not accept article with grammatical mistakes and spelling errors. Tables and Figures must be clear and sharp by using jpeg or tiff. Turnitin <20%.

3. Resubmit hasil revisi artikel



4. Menanyakan progres review

The screenshot shows a Gmail interface on a mobile device. The left sidebar contains navigation options: Mail (99%), Chat, Spaces, and Meet. The main area displays an email from Sunawan Sunawan to Dr. Nor Arpizah Atan. The email subject is "The revised version of my article" and it is marked as "Kotak Masuk". The email content discusses the submission of a revised article and asks for an update on the review progress.

Subject: The revised version of my article Kotak Masuk x

From: Sunawan Sunawan <sunawan@mail.unnes.ac.id>
kepada Nor, Nor

To: Dear Dr. Nor Arpizah Atan
Managing Editor of MJLI

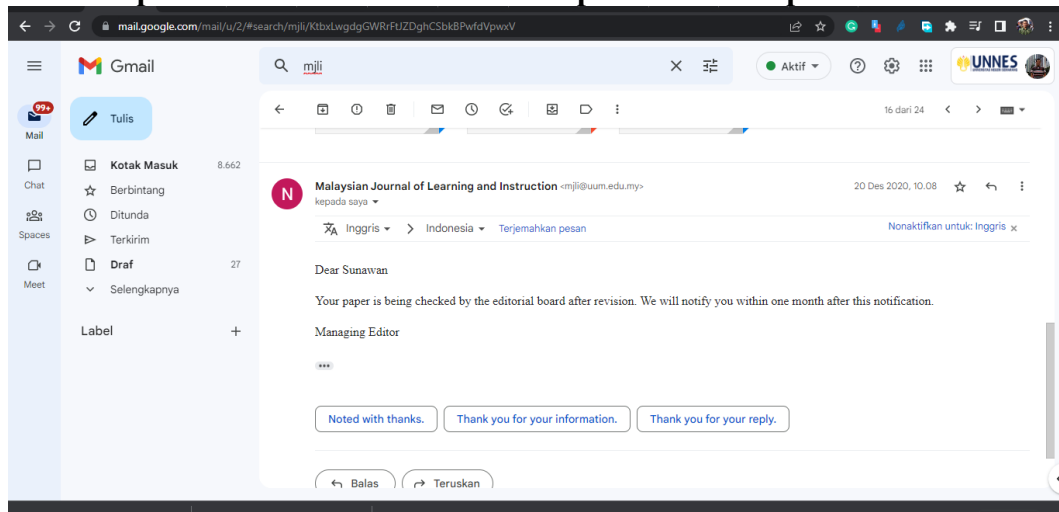
Sel, 24 Nov 2020, 08:58

I would like to inform you that I have revised and resubmit the article following the reviewers' feedback as attached (include with the list of rebuttal form). The article also has been proofread by a native (see the receipt as attached). However, after resubmit the revised article (at 21 October before editor's deadline) I do not received the editor feedbacks yet. Is there any problem with my resubmission process? Or is the revised article still under review? I would like to receive any information about the progress of my article. Thanks for your responses.

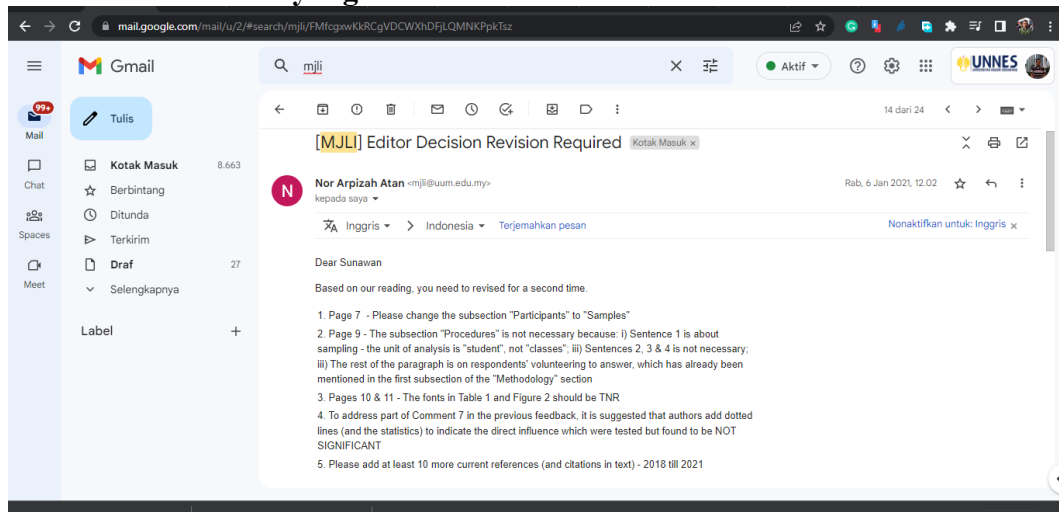
Best regards,

—
Sunawan, Ph.D.
Lecturer
Department of Guidance and Counseling
Faculty of Education
Universitas Sebelas Maret

5. Mendapat konfirmasi bahwa manuskrip masih dalam proses review



6. Permintaan revisi yang ke-2



The screenshot shows a Gmail interface with a search bar containing 'mjli'. The left sidebar shows the 'Gmail' logo and navigation options like 'Mail', 'Chat', 'Spaces', and 'Meet'. The main content area displays an email from 'Nor Arpizah Atan' with the subject '[MJLI] Editor Decision Revision Required'. The email body contains the following revision requests:

Dear Sunawan

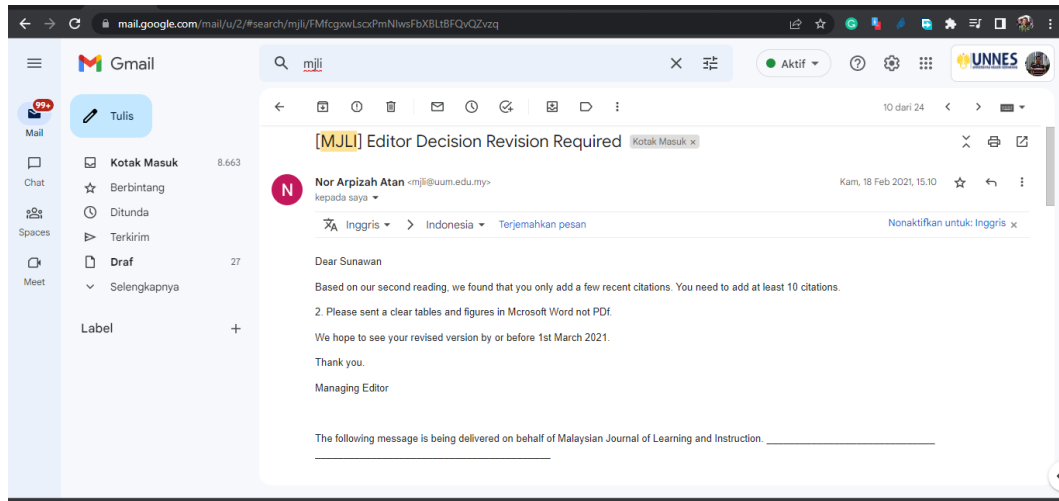
Based on our reading, you need to revised for a second time.

1. Page 7 - Please change the subsection "Participants" to "Samples"
2. Page 9 - The subsection "Procedures" is not necessary because. i) Sentence 1 is about sampling - the unit of analysis is "student", not "classes"; ii) Sentences 2, 3 & 4 is not necessary; iii) The rest of the paragraph is on respondents' volunteering to answer, which has already been mentioned in the first subsection of the "Methodology" section
3. Pages 10 & 11 - The fonts in Table 1 and Figure 2 should be TNR
4. To address part of Comment 7 in the previous feedback, it is suggested that authors add dotted lines (and the statistics) to indicate the direct influence which were tested but found to be NOT SIGNIFICANT
5. Please add at least 10 more current references (and citations in text) - 2018 till 2021

7. Resubmit hasil revisi yang ke-2

The screenshot shows a Gmail interface on a desktop browser. The search bar at the top contains the word "mjli". The left sidebar shows the Gmail navigation menu with categories like Mail, Chat, Spaces, and Meet. The main content area displays an email from Sunawan Sunawan (sunawan@mail.unnes.ac.id) to Malaysia, dated January 12, 2021, at 13:30. The email text reads: "Dear Nor Apizah Atan. Attached is the second revision of my article. I have made revisions in accordance with reviewer comments from number #1 to #4. Whereas for number #5, I have added 8 new references. Best regards, Sunawan". Below the text, there is a placeholder for an attachment titled "Satu lampiran • Dipindai dengan Gmail". A small thumbnail of the attachment is visible at the bottom, with the text "Artikel untuk MJL..." and a Word icon.

8. Permintaan revisi yang ke-3



9. Resubmit hasil revisi artikel yang ke-3

The screenshot shows a Gmail interface on a desktop browser. The search bar contains the word "mjli". The left sidebar shows the Gmail navigation menu with options like "Mail", "Chat", "Spaces", "Meet", and "Label". The main content area displays an email from "Sunawan Sunawan" sent on 15 Mar 2021 at 19:38. The email body contains the following text:

Dear Dr. Nor Arpizah Atan,

Attached is the revised manuscript and figure (in a separate file) as required. I had added 21 latest references between 2017-2021 and also updated some sentences in accordance with the reference. I hope the revised manuscript fulfills the editor's requirements. I am sorry because sent the revised article two weeks after the deadline.

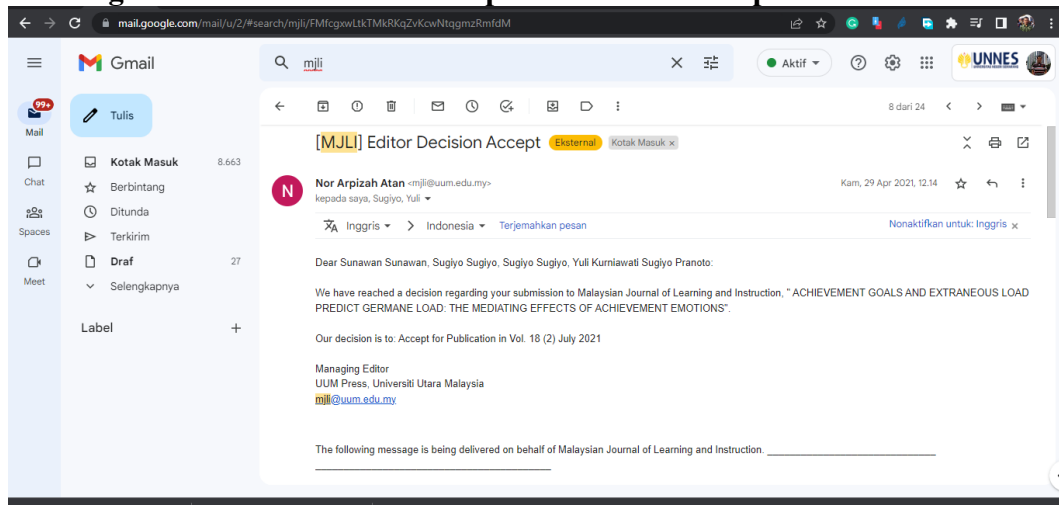
Best regards,

Sunawan

Below the text, there are two attachments:

- Artikel untuk MJL...
- The figure 1 and 2...

10. Pengumuman bahwa manuskrip diterima untuk dipublikasi



The screenshot shows a Gmail interface with a search bar containing 'mjli'. The left sidebar lists various email folders: Mail (99+), Chat, Spaces, and Meet. The main content area displays an email from Nor Arpizah Atan (mjli@uum.edu.my) dated 'Kam, 29 Apr 2021, 12:14'. The subject is '[MJLI] Editor Decision Accept'. The email body contains the following text:

Dear Sunawan Sunawan, Suglyo Suglyo, Suglyo Suglyo, Yuli Kurniawati Suglyo Pranoto:

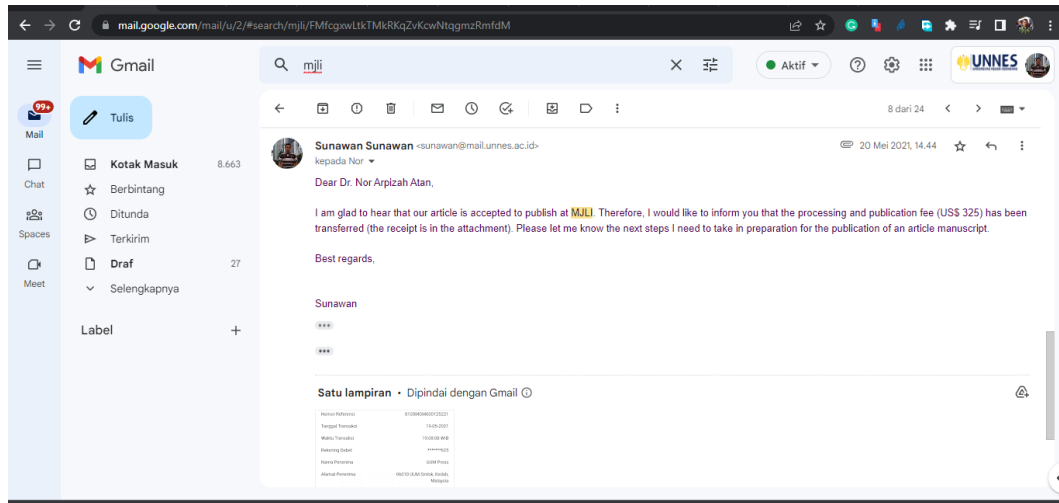
We have reached a decision regarding your submission to Malaysian Journal of Learning and Instruction, "ACHIEVEMENT GOALS AND EXTRANEIOUS LOAD PREDICT GERMANE LOAD. THE MEDIATING EFFECTS OF ACHIEVEMENT EMOTIONS".

Our decision is to: Accept for Publication in Vol. 18 (2) July 2021

Managing Editor
UUM Press, Universiti Utara Malaysia
mjli@uum.edu.my

The following message is being delivered on behalf of Malaysian Journal of Learning and Instruction.

11. Melakukan pembayaran biaya publikasi



Draft Manuskrip Saat Submisi Awal:

**THE INTERPLAY OF ACHIEVEMENT GOALS AND
EXTRANEOUS LOAD WITH GERMANE LOAD: A
MEDIATING EFFECT OF ACHIEVEMENT EMOTIONS**

ABSTRACT

Purpose – This study aims to examine the role of emotion achievement in mediating the relationship of goal orientation and extraneous load with germane load.

Methodology – This survey study involved voluntary 487 university students who were selected using the cluster random sampling technique. They responded three adapted scale in Bahasa Indonesia version, namely Achievement Goal Questionnaire (AGQ), Achievement Emotions Questionnaire (AEQ), and Cognitive Load Questionnaire. Data were collected 20 minutes before the Statistics Class ended and analyzed using bootstrapped bias corrected (CI = 95%; N=5000) in Structural Equation Modelling (SEM).

Findings – The results of this study indicated the effect of emotional mediators on achievement of the relationship between goal orientation and extraneous load with germane load. Specifically, enjoyment positively mediated the relationship between mastery approach orientation and germane load, while anxiety mediated the relationship between mastery approach and performance-avoidance goals orientation with germane load. Although extraneous load had a negative direct correlation with germane load, the prediction of extraneous load on germane load was positively mediated by anxiety and negatively by enjoyment.

Significance – The findings of this study confirm the impact of motivation and emotions on cognitive load and specify the extraneous load relationship with germane load through achievement emotions.

Keywords: achievement goals, cognitive load, achievement emotions

INTRODUCTION

Students' emotional condition during learning influence their learning performance (Chen & Sun, 2012; Marchand & Guterez, 2012; Sunawan & Xiong, 2017) because

both cognitive and affective processes require allocation of attention to process information (Awh, Vogel, & Oh, 2006), whereas working memory resources are limited to process cognitive and emotional information (King & Schaefer, 2011). In the perspective of cognitive load theory, the use of limited cognitive resources will be optimal if students focus on processing related-learning information (germane load) and reduce the allocation of cognitive resources in processing irrelevant and unnecessary learning information during the instructional process (extraneous load; Sweller, Ayres, & Kalyuga, 2011).

Many studies have been designed to identify the impact of achievement emotions on cognitive performance. Based on control-value theory of academic emotions (Pekrun, 2006), the study showed the prediction of achievement emotions on the use of learning strategies (You & Kang, 2014) and academic achievement (Marchand & Guttieres, 2012). Based on cognitive-affective theory of learning with media (CATLM; Moreno, 2006), the study showed that emotional design of multimedia had prediction on emotions, learning activity and cognitive load (Park, Knorzer, Plass, & Brunken, 2015). In short, various studies have indicated that achievement emotions had relatively significant and consistent prediction on cognitive performance.

However, there are still unanswered questions about the impact of emotions on cognitive performance, such as, "Is the impact of achievement emotions on cognitive performance linear?" (Plass & Kaplan, 2016). This question is important

to get confirmation and clarification because many studies of emotions and cognitive performance showed that achievement emotions positively predict cognitive load (Chen & Chang, 2009; Sunawan & Xiong, 2017), the use of learning strategies, self-regulated learning and academic achievements (Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011). Whereas, Pekrun (2006) warned that positive emotions are not always adaptive, while negative emotions are not always less adaptive because individuals need a little negative emotion, such as anxiety, to extent and increase their motivation. On the other hand, the existence of excessive positive emotions, such as enjoyment, makes students tend to pay less attention to the learning information. This opinion is important to be clarified because the research findings from D'Mello, Lehman, Pekrun and Graesser (2014) showed that confusion as a negative achievement emotion can encourage further learning processes and the use of deep thinking strategies. In order to clarify the gaps in findings about the positive prediction of positive emotions and the negative prediction of negative emotions on cognitive performance, this study was designed to clarify the findings of the impact of achievement emotions on cognitive performance by testing the affect of enjoyment as positive emotion and anxiety as a negative emotion on germane load.

In other side, achievement emotions may be stimulated by goal adoption (Linnenbrink, 2007). Most of the studies relatively consistent showed that mastery achievement goal orientation positively predict positive emotions, such as enjoyment, but performance-avoidance goal orientation positively predict negative

emotion, such as anxiety (Linnenbrink, Ryan, & Pintrich, 1999; Pekrun, Elliot, & Maier, 2009). Then, students' negative emotions decrease working memory performance (Linnenbrink, Ryan, & Pintrich, 1999). To extend the study from Linnenbrink, Ryan, and Pintrich (1999), present study explores both enjoyment as a positive emotion and anxiety as a negative emotion in mediating the prediction of achievement goals on germane load. Furthermore, the role of achievement emotions in mediating the unnecessary and irrelevant information to learning during instructional process as extraneous load also investigated in present study. In short, this study explore the indirect effect of achievement emotions in mediating the relationship between achievement goals orientation, particularly mastery-approach and performance-avoidance goals orientation, and extraneous load with germane load.

LITERATURE REVIEW

Prediction of Extraneous Load on Germane Load

Cognitive load theory discusses the load of working memory during process information. Because cognitive resource of working memory was limited, allocating working memory resource for optimal processing relevance information with learning objecting determine students' learning performance. In this circumstance, cognitive load was the most predictor for students' learning performance (Clark, Nguyen & Sweller, 2006). Paas, vanGog and Sweller (2010: 116) defined cognitive load as "the learning of complex cognitive tasks, in which learners are often overwhelmed by the number of interactive information elements

that need to be processed simultaneously before meaningful learning can commence.” The level of cognitive load is depend on the amount of element interactivity of information (Sweller, 2010). A larger amount of information usually has a more complex element interactivity and vice versa, and prior knowledge also influence the complexity level of element interactivity of information (Scheiter, Gerjets, Vollmann & Catrambone, 2009).

There are three types of cognitive load, namely extraneous, intrinsic and germane cognitive load (Sweller, 2010). Intrinsic cognitive load related to the complexity of intrinsic information that should be processed. Extraneous cognitive load related to the irrelevant learning-information which come from instructional method when presenting information. Germane cognitive load related to the effort to process and create new information. Present study intended to investigate the relationship between extraneous load and germane load.

Previous study has been found that extraneous load negatively predicted germane load (Lange, Costle, & Han, 2017). If the level of extraneous load are exceed the capacity of working memory, then the processing of learning-information in working memory will be decrease. Contrary, when cognitive resource experience less extraneous cognitive load, working memory enable to process more information. In short, decreasing extraneous cognitive load will increase germane cognitive load. This situation give beneficial for optimal learning and information processing. Considering finding of previous study which showed the impact of

anxiety on cognitive load under low load condition (Dvorak-Bertsch, Curtin, Rubinstein, & Newman, 2007), effect of instructional design which presenting irrelevant information with learning objectives on germane load need to be studied by involving the role of achievement emotions as a mediator. As preliminary investigation of achievement emotions in mediation correlation between extraneous load and germane load, present study involved two types of academic achievement, namely enjoyment and anxiety, because the two types of emotions most occur in learning. The research questions that arise in this study, “Is the negative impact of extraneous load on germane load consistent when mediated by emotions of enjoyment and anxiety?” If there are currently two contradictory theories about interplay of anxiety with cognitive load, namely (1) cognitive load can reduce anxiety and (2) cognitive load can reduce anxiety (Vytal, Cornwell, Arkin, & Grillon, 2012), then this study explores the role of enjoyment and anxiety in reducing cognitive performance.

Prediction of Achievement Goals on Germane Load through Achievement Emotions

Elliot and Fryer (2008) defined goal orientation as a cognitive representation of future objects that the organism is committed to approach or avoid. In learning context, this definition suggested that the goal being a cognitive representation of what a student wants to attain or achieve from their learning in the future. Achievement goal orientation provide the basis, rationale, and direction for effort, motivation, the use of learning strategies, academic achievement and achievement

(Anderman, Austin, & Johnson, 2002; Trust & Hursh, 2008; Pekrun, Meier, & Elliot, 2009).

Moreover, Elliot dan McGregor (2001) divided achievement goal orientation into 2 (definition: mastery vs performance) x 2 (valence: approach vs avoidance) dimensions. Mastery-approach goals are a form of defining competencies within intrapersonal scope that must be mastered to meet personal demands and have a positive valence to master them. Performance-approaches goals are a form of defining competencies normatively and have a positive valence to achieve them. Mastery-avoidance goals are a form of defining competencies within intrapersonal scope that must be mastered to meet personal demands and have a negative valence to achieve them. Performance-avoidance goals are a form of defining competencies within normative limits and having a negative valence to attain them. Present study involved two contradictory achievement goal orientation, namely mastery-approach goal orientation and performance-avoidance goal orientation.

Previous studies suggested that the impact of achievement goals orientation on learning performance were indirect and mediated by learning strategies (Wirth, Kunsting, & Leutner, 2009) and emotions (Putwain, Sanger & Larkin, 2013). Because a study from Pekrun, Elliot and Meier (2009) showed that prediction of achievement goals orientation were inconsistent when mediated by different type of achievement emotions, present study investigated the mediation role of enjoyment and anxiety. The potential for indirect effects of achievement goal

orientation on cognitive load can be seen from the results of experimental studies Wirth, Kunsting, and Leutner (2009) which indicated that participants who adopted the goal of problem solving had a higher cognitive load compared to participants who adopted learning goals. Furthermore, the findings of the study concluded that the impact of goals on cognitive load appears in terms of strategy use, where participants with learning objectives have strategies that are more effective than participants with the aim of problem solving.

The impact of goal orientation on achievement emotions can be seen from the research findings conducted by Pekrun, Elliot, and Meier (2009). The results of the study indicated that goal orientation both mastery goal orientation predicts positive pleasure, while anxiety is positively predicted by performance-avoidance goal orientation. The meta-analysis conducted by Huang (2011) shows that mastery goal orientation correlates positively with positive emotions, while performance-avoidance goal orientation correlates positively with negative emotions. Furthermore, results of the Huang's study showed that the approach-performance goal orientation is not too consistent with positive emotions. Therefore, this research only involves two extremely types of goal orientation, namely mastery approach goal orientation and performance-avoidance goal orientation.

METHODOLOGY

Participants

The sample involved in this study were 487 students (191 men and 296 women) from Faculty of Education, Universitas Negeri Semarang, who were selected using the cluster random sampling technique. Their willingness to participate in this study was expressed in informed consent.

Measurements

Data of this study was collected using three scales, namely Achievement Goal Questionnaire (AGQ), Achievement Emotions Questionnaire (AEQ), Cognitive Load Questionnaire in version of Bahasa Indonesia. Because the origin version of those scales were English, a back-translation procedure was applied to adapt English version of the scales into Bahasa Indonesian version.

Cognitive load

Students' extraneous cognitive load and germane cognitive load during attending Statistical class was measure subjectively using a scale which adapted from Cognitive Load Questionnaire (Leppink, Paas, Gog, Vlueten & Merrienboer, 2014). The scale has 8 items for assessing extraneous load (4 item; "*The explanations and instructions in Statistics class were very unclear.*"), and germane load (4 items; "*Statistics class really enhanced my understanding of the content that was covered.*"). The reliability test in present study indicated that this scale had alpha coefficient of .90 for extraneous load and .89 for germane load (see Table 1).

Achievement emotions

Present study assessed students' emotions of enjoyment and anxiety during study in Statistics class using Academic Emotions Questionnaire (AEQ; Pekrun, Goetz, Titz, & Perry, 2002). Students' enjoyment were assessed using 4 items ("*I get*

excited about going to Statistics class.”), whereas students’ anxiety were assessed using 5 items (*“I feel nervous in Statistics class.”*). The alpha reliability of this scale were .78 for both enjoyment and anxiety (see Table 1).

Achievement goal orientation

The Achievement Goals Questionnaire (AGQ; Elliot & McGregor, 2001) were implemented to assess two kinds of students goal orientation during learning in Statistics class, namely mastery-approach goal orientation (3 items; *“I want to learn as much as possible from Statistics class.”*) and performance-avoidance goal orientation (items; *“I just want to avoid doing poorly in Statistics class.”*). The AGQ had 7-point scale from not at all the case (1) to completely the case (7). Results of reliability test showed that the alpha coefficients were .73 for mastery-approach goal orientation and .81 for performance-avoidance goal orientation (see Table 1).

Procedures

At the beginning of class, participants were told that before the Statistics lecture was terminated they would be asked to respond the scale of the study according to their experiences during attending the Statistics class that day. They were asked to study at Statistics classes as usual and do not need to be nervous. All responses from respondents were not related to the assessment in the Statistics class. Twenty-minutes before the class ended, they were asked to express their experiences during study by responding cognitive load scales, academic emotions, and goal orientation, respectively. Participants were asked to respond to all scale items voluntarily. Participants respectively responded the Cognitive Load Scale, Academic Emotion Questionnaire, and Achievement Goal Questionnaire in about 15 minutes.

RESULTS

Descriptive Data

The results of the intercorrelation matrix are presented in Table 1. Based on Table 1, it can be seen that there was a positive correlation between the types of goal orientation. Likewise with the types of academic emotions and cognitive load which also correlated. However, not all goal orientations correlated with any type of academic emotion. In turn, only emotions of anxiety that did not show a relationship with germane load, while pleasure emotions correlated with extraneous load and germane load.

Tabel 1

The intercorrelation matrix, mean and standard deviation

	1	2	3	4	5	6
1. Mastery-approach	(.73)					
2. Performance-avoidance	.17**	(.81)				
3. Enjoyment	.33**	-.05	(.78)			
4. Anxiety	.02	.40**	-.28**	(.78)		
5. Extraneous load	-.03	.19**	-.28**	.37**	(.90)	
6. Germane load	.23**	.02	.44**	.05	.17**	(.89)
M	4.22	3.79	3.76	2.78	2.73	3.77
SD	0.62	0.84	0.65	0.78	0.87	0.54

Note: Alpha reliability is shown in parentheses

** $p < .01$

Relationship between Achievement Goals, Extraneous Load, and Germane

Load

This study examines predictions of achievement goals and extraneous load on germane load through achievement emotions (enjoyment and anxiety) as a

mediator. The results of structural equation modelling produced an acceptable fit model ($\chi^2(216) = 367.07, p < .01, \chi^2/df = 1.70, CFI = .997, RMSEA = .04$).

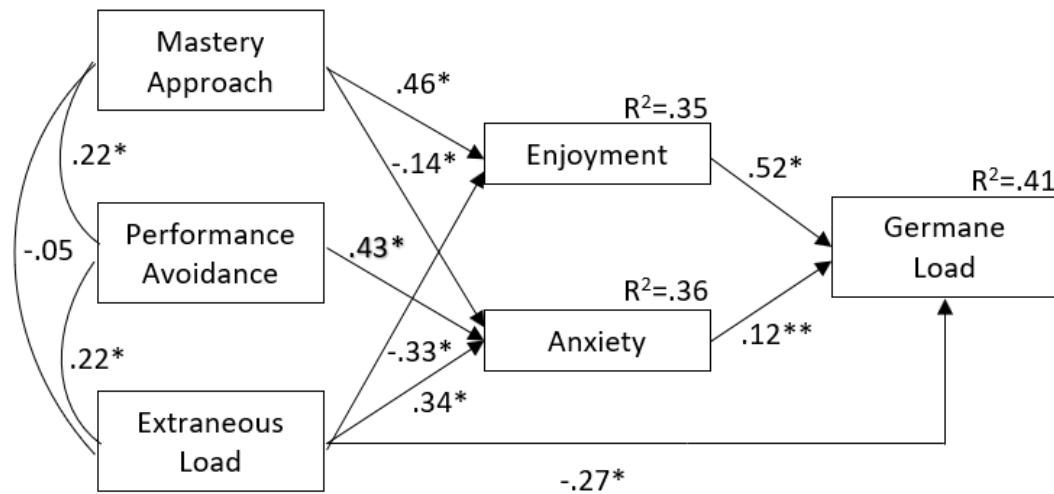


Figure 1. Predicting model of germane load
 $(\chi^2(216) = 367.07, p < .01, \chi^2/df = 1.70, CFI = .997, RMSEA = .04)$
 $*p < .01$ $**p < .05$

Based on Figure 1, it can be seen that germane loads were positively predicted by enjoyment ($\beta = .52, p < .01$) and anxiety ($\beta = .12, p < .05$). However, the prediction of enjoyment on germane load was more powerful than anxiety. Then, achievement emotions were predicted by the achievement goals and extraneous load; enjoyment was positively predicted by the mastery-approach goal orientation ($\beta = .46, p < .01$) and negatively predicted by extraneous load ($\beta = -.33, p < .01$). Anxiety was positively predicted by performance-avoidance goal orientation ($\beta = .43, p < .01$) and extraneous load ($\beta = .34, p < .01$), but negatively predicted by mastery-approach goal orientation ($\beta = -.14, p < .01$). Beside achievement emotions, the model in this study showed that extraneous load also had a direct relationship with germane load

($\beta = -.27, p < .01$), while the relationship between goals orientation and germane load were mediated by achievement emotions.

The Mediating Effect of Achievement Emotions

The role of achievement emotions in mediating achievement goals and extraneous load with germane load were analyzed using bootstrapped bias corrected (CI = 95%; N=5000). The mediation effect of achievement emotions were presented in Table 2. The findings of present study indicated that both enjoyment and anxiety had a significant mediator effect. Enjoyment positively mediated the relationship between the mastery-approach goal orientation and the germane load, but negatively mediated relationship between extraneous load and germane load. Contrary to enjoyment, anxiety negatively mediated the relationship between mastery-approach goal orientation and germane load, but positively mediated the prediction of performance-avoidance goal orientation and extraneous load on germane load.

Table 2

The mediation effects of academic emotions

Mediator	Estimation	SE	Bias-corrected 95%		p
			LL	UL	
MAp → Enj → GL	.23	.04	.16	.32	<.01
MAp → Anx → GL	-.01	.01	-.04	-.02	<.05
PAv → Anx → GL	.03	.02	.01	.17	<.05
EL → Anx → GL	.03	.01	.01	.05	<.05
EL → Enj → GL	-.11	.02	-.16	-.07	<.01

Note: MAp = Mastery-approach goal orientation; PAv = Performance-avoidance goal orientation; Enj = Enjoyment; Anx = Anxiety; EL = Extraneous load; GL = Germane load

Discussion

The current study was intended to examine the impact of enjoyment and anxiety in mediating prediction of two achievement goals orientation (namely, mastery-approach goal orientation and performance-avoidance goal orientation) and extraneous load on germane load. In line with the findings of previous research (Chen & Chang, 2009; Vytal, et al., 2012), the results of this study indicated that enjoyment and anxiety are related to cognitive load. In addition, the results of this study also showed that the goal orientation predicts enjoyment and anxiety as found in previous studies from Pekrun, Elliot and Maier (2009). Interestingly, the findings of the present study were successful in identifying the mediator effect of achievement emotions (particularly enjoyment and anxiety) on achievement goals orientation and extraneous load with germane load. This finding supports the notion of cognitive affective theory of learning with media (CATLM; Moreno, 2006) which states that motivation and affection support the working memory performance. Findings of present study successfully proved that motivation,

particularly achievement goals orientation, do not have direct impact on working memory performance. Motivational contributions to working memory performance, especially germane load, can occur through academic emotions, such as enjoyment and anxiety. These findings of this study confirms the importance of achievement emotions during learning process.

Motivational and emotional impacts on germane load in present study can be understood considering Valiente, Swanson and Eisinberg (2012) have explained that motivation and emotion enable enhance or inhibit performance of working memory. Enjoyment has known to encourages the implementation of effective strategies for processing learning information (You & Kang, 2014). A previous finding has showed that anxiety reduced performance of working memory (Meisner & Bogner, 2012), but in present study found that anxiety had a positive prediction on germane load, although the prediction of anxiety on germane load was lower than the prediction of enjoyment. This finding reflected that the low level of anxiety increases alertness to always process learning information. If the number of alertness is excessive, the attention will be diverted to the anxiety alertness instead of the learning information. This finding confirms Pekrun's (2006) view that not all negative emotions adversely affect cognitive performance.

Finding of present study also exerted that emotions are closer predictors for working memory performance than motivation. In line with studies from Putwain, Sender, and Larkin (2019) and Pekrun, Elliot and Maier (2009), present study found that

achievement emotions mediated the correlation between motivation and cognitive performance. Specifically, enjoyment positively mediated the prediction of mastery-approach goal orientation on germane load, whereas anxiety negatively mediated the prediction of mastery-approach goal orientation on germane load, but positively mediated the prediction of performance-avoidance goal orientation on germane load. These findings suggested that adoption performance-avoidance goal orientation stimulate the alertness of failure risks to attain a certain level of learning performance so that raises anxiety. Then, a low level of anxiety encourages the using of cognitive resources to process learning information. However, the adoption of mastery-approach goal orientation encourages the optimally use of cognitive resources for processing learning information, so that the existence of anxiety decreases cognitive performance in processing information.

Another result of present study showed that extraneous load directly predicts germane load negatively. This result was supported a previous study from Lange and Costly (2017). Interestingly, finding of present study success to specify the impact of extraneous load on germane load when involving achievement emotions as a mediator. Anxiety mediates the positive prediction of extraneous load on germane load, but the enjoyment mediates the negative prediction of the extraneous load on germane load. The findings of this study suggested when the learning process presents or discusses irrelevant learning information raises anxiety about probability of learning failure in the future, it will encourage the use of cognitive resources to select and process relevant information to the learning objectives.

However, when presenting irrelevant learning information throughout learning makes students happy, it will encourage students to ignore the relevant processing of learning-information.

Overall, the findings of this study had suggested the importance of adaptive achievement goals (particularly, mastery approach goal) for students and efforts to minimize the irrelevant learning-information during learning process. Implications for learning, students need to be facilitated to develop a mastery-approach goal orientation so that they are enjoy in attending class and, in turn, optimally use their cognitive resources to process learning information. In addition, when students realize that their learning are not relevant to achieving learning goals, they allocate efforts to re-focus on achieving learning goals.

CONCLUSION

Present study success to identify the role of achievement emotions as mediator between goal orientation and germane load. Specifically, enjoyment positively mediated the interplay between mastery-approach goal and germane load, but anxiety negatively mediated the relationship between mastery-approach goal and germane load. The prediction of performance-avoidance goal on germane load was positively mediated by anxiety. Moreover, although extraneous load has direct correlation with germane load, the specific type of correlation between extraneous load and germane load was mediated by achievement emotions.

There is a few limitation from present study. Firstly, findings of mediating role of achievement emotions in this study were proven from a correlational study. Future studies are expected to test the mediating role of achievement emotions under controlled situation from experimental study. Secondly, this study was limited on two types of achievement emotions, namely enjoyment and anxiety, two types of achievement goals orientation, namely mastery-approach goal orientation and performance-avoidance goal orientation. The findings of the next studies will provide meaningful enlightenment if it involves a more diverse type of emotion and the type of achievement goal orientation. Finally, self-rating scales were applied to assess students' emotions and cognitive load in this study. Therefore, the use of objective measurement methods in assessing emotions and cognitive load will be very beneficial because the findings of motivational and emotional effects on germane loads are drawn from the more accurate data.

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