

Evaluation of the Implementation of Vocational Gas and Arc Welding Subjects in Malaysian Secondary Schools

Nurul Azlin Rosman¹, Mohd Zulfadli Rozali^{2*}

¹Fakulti Pendidikan Teknikal dan Vokasional,
Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, 86400, MALAYSIA

*Corresponding Author

DOI: <https://doi.org/10.30880/ojtp.2023.08.02.009>

Received 27 March 2023; Accepted 20 September 2023; Available online 30 September 2023

Abstract: Mata Pelajaran Vokasional Kimpalan Arka dan Gas (MPV-KAG) is an initiative of the Ministry of Education (Malaysia) to provide opportunities for students in academic secondary schools who have not succeeded in getting a place in Sekolah Menengah Teknik (SMT) or Sekolah Menengah Vokasional (SMV). Therefore, this study was conducted to evaluate the readiness for the implementation of vocational subjects (gas and arc welding) in daily secondary schools in Malaysia. A total of 106 students who took the MPV-KAG course at Sekolah Menengah Kebangsaan Malim, Sekolah Menengah Kebangsaan Ledang, Sekolah Menengah Kebangsaan Ungku Husin, and Sekolah Menengah Kebangsaan Ungku Aziz were involved in this study. The questionnaires for this study were distributed to students who took the MPV-KAG course at the four daily secondary schools. This study uses a descriptive analysis method (mean and standard deviation). The reliability value for the study instrument is $\alpha = 0.86$. Overall, the results of the study showed that the level of willingness of students to follow MPV-KAG courses, the level of opportunities given by the teacher to the students in doing activities according to their own abilities during the teaching and learning process, and the availability of sufficient, functional, and appropriate workshop equipment facilities throughout the MPV practical class were at a high level, with a mean value of ($M = 4.11$, $M = 4.06$, $M = 4.29$). In conclusion, this study found that the implementation of MPV-KAG in daily secondary schools in Malaysia is in good condition.

Keywords: Mata Pelajaran Vokasional Kimpalan Arka dan Gas, Sekolah Menengah Harian, Gas and Arc Welding

1. Introduction

The education system plays an important role in producing skilled and semi-skilled workers to meet the needs of the job market in the future (Jalil et al., 2015). Therefore, the Malaysian government has taken the initiative to increase the capacity of Technical Education and Vocational Training (TVET) institutions to provide highly skilled students by introducing vocational fields at the secondary school level (Ismail et al., 2017). Realizing this fact, the Malaysian Ministry of Education implemented the Mata Pelajaran Vokasional (MPV) in daily secondary schools in stages from 2002 to 2005 (four phases). It was introduced to upper secondary students (Form 4 and Form 5) to form a positive perception towards technical and vocational fields and increase students' motivation to continue their studies and career aspirations in the same field.

Mata Pelajaran Vokasional Kimpalan Arka dan Gas (MPV-KAG) is one of the elective subjects in the Science, Engineering, and Mathematics (STEM) group that is introduced to Form 4 and 5 students. This course focuses on the mastery of knowledge and skills in the field of welding such as arc welding, oxyacetylene gas welding, Metal Inert Gas (MIG) welding, and Tungsten Inert Gas (TIG) welding (Bahagian Pembangunan Kurikulum, 2018). It is a contextual curriculum that gives students the opportunity to apply knowledge through hands-on activities that are useful in daily life and work. In general, the implementation of the MPV program patterned on vocational skills can train our students to become knowledgeable and virtuous citizens in facing the challenges of the country's life in the future.

Even though the MPV-KAG has been implemented for 17 years in daily secondary schools, student achievement is still less than satisfactory. This could be due to students' willingness to follow this subject. Therefore, teachers and school administrators should work harder to overcome various problems involving the readiness and acceptance of students towards the implementation of MPV-KAG. Additionally, there is less involvement of MPV-KAG students in the teaching and learning process as a result of less concentration in class. So, it is very important for teachers to give students the opportunity to do activities based on their own abilities. With this, teachers can identify the level of ability and knowledge acceptance of each student in the class. Finally, most daily secondary schools that offer MPV-KAG are faced with the problem of insufficient equipment and facilities for MPV-KAG students. The availability of workshop equipment that is sufficient, functional, and compatible with the requirements of the curriculum can help improve students' understanding and skills during the teaching and learning process.

In this study, the perception of MPV-KAG students regarding the implementation of the MPV-KAG stream was studied first through the students' readiness to follow the MPV-KAG stream. Next, the researcher examined the opportunities given by the teacher to the students in doing activities according to their abilities during the teaching and learning process during the MPV class. The perception of MPV students in the aspect of workshop equipment facilities being sufficient, functional, and appropriate throughout the MPV practical class was also investigated in this study.

1.1 Student's Readiness

Readiness refers to a form of process that involves the integration of physical, mental and emotional aspects of a student when performing an action (Baharudin & Ibrahim, 2020). Readiness to learn from a cognitive aspect means a student's mental readiness to understand, and identify new learning situations based on their experience. Usually, a student's intellectual development moves in tandem with cognitive skills. Affective learning is through behavior that shows interest and desire in learning new learning activities. With this, the learning process carried out will be more fun and raise the students' spirits in seeking new knowledge. Psychomotor readiness requires that a student has the potential and is ready to do physical activity in the learning process. This learning requires continuous training to improve existing skills.

1.2 Chances for Students do Activities According to Their Ability

The learning process will be more effective if the teacher gives students the opportunity to do interactive activities in the classroom. In addition, teachers can also test students' abilities in solving questions or problems given according to each student's ability. The study of Aziz et al. (2021) encourage students to be actively involved in the learning process to improve thinking skills and the application of theoretical and practical knowledge that has been learned. In a study done by Haniffa et al. (2018), stated that classroom teaching can no longer remain conventional and suggests instructors to normalize student-centered learning to enable students to integrate their knowledge into the developing world.

1.3 Workshop Equipment is Sufficient, Appropriate and Functional

Workshop equipment is one of the infrastructure facilities provided by the government to each school. For the learning of technical subjects, facilities refer to conducive classes, workshops or laboratories that are equipped with machines and equipment. In a study by Rahman et al., (2022) states that infrastructure facilities are no longer a wish but have become a necessity in ensuring the curriculum implementation process and an effective curriculum. The institution should provide sufficient infrastructure as a catalyst for the emergence of students who are more disciplined and able to improve the development of education in a comprehensive manner. Good infrastructure facilities can stimulate teachers and students in ensuring the objective of the subject being studied can be achieved effectively.

2. Methodology

In order to carry out this study, the researcher has used a descriptive quantitative survey method, which is using a questionnaire as a research instrument. Descriptive aims to gather information about variables and make a description of the phenomenon that occurs. A questionnaire will be given to respondents to conduct this study.

2.1 Population and Sample

This study is comprised of *Mata Pelajaran Vokasional Kimpalan Arka dan Gas* program students at *Sekolah Menengah Kebangsaan Malim, Sekolah Menengah Kebangsaan Ledang, Sekolah Menengah Kebangsaan Ungku Husin, and Sekolah Menengah Kebangsaan Ungku Aziz*. The researcher chose students at 4 vocational colleges because of the constraints and lack of time to conduct research at all daily secondary schools that offered *MPV-KAG* courses. The student population of the *MPV-KAG* program at these 4 daily secondary schools is a total of 142 people as stated in table 1. The number of respondents in this study was determined based on the sample size table developed by Krejcie and Morgan (1970). The sampling method used in this study is probability sampling which is simple random sampling. The selected sample at least has the same characteristics as the population in the research (Sekaran & Bougie, 2014). Therefore, for a population of 142 people, the appropriate sample size for this study is 106 respondents.

Table 1 - Population distribution and sample of *MPV-KAG* course students

Daily Secondary School	Total Population	Total Sample Selected
SMK Malim	30	30
SMK Ledang	50	30
SMK Ungku Husin	32	20
SMK Ungku Aziz	30	26
Total	142	106

2.2 Instrument of Study

For the research instrument, researchers use the questionnaire as an instrument of information collection and the questionnaires were adapted from a previous review containing 21 items which consists of three elements, the willingness of students to follow *MPV-KAG* courses, the opportunities given by the teacher to the students in doing activities according to their own abilities during the teaching and learning process during the *MPV-KAG* class and the workshop equipment facilities being sufficient, functional and appropriate throughout the *MPV-KAG* practical class. The questionnaire will be examined using a Likert scale (Table 2) to determine how far the study's goals have been achieved. According to Albaum (1997), instruments that use a five-point Likert scale are more stable in use.

Table 2 - Likert scale (Albaum,1997)

Rating	Scale
Strongly Disagree (SD)	1
Do Not Agree (DA)	2
Not Sure (NS)	3
Agreed (A)	4
Strongly Agree (SA)	5

2.3 Data Analysis

The data that has been collected will be analyzed using the Statistical Package for the Social System (SPSS) software. The type of quantitative analysis used is statistical analysis. The split statistical analysis for this study is descriptive statistics. The mean score for the willingness of students to follow *MPV-KAG* courses, the opportunities given by the teacher to the students in doing activities according to their own abilities during the teaching and learning process during the *MPV-KAG* class and the workshop equipment facilities being sufficient, functional and appropriate throughout the *MPV-KAG* practical class were analyzed using descriptive statistics. The researcher used the mean score to analyze the data from the questionnaire items in the form of a Likert scale. Table 3 shows the interpretation of the mean range level that gives low, medium and high results.

Table 3 - Interpretation of the mean range level

Mean Value	Interpretation level
3.67 - 5.00	High
2.34 - 3.66	Medium
1.00 - 2.33	<u>Low</u>

3. Results and Discussion

The data analysis addressed the conclusions of the data obtained from the respondents. The goal is to evaluate the readiness for the implementation of vocational subjects (gas and arc welding) in daily secondary schools in Malaysia. Each item also has a frequency value and a percentage value according to the respondent's response to the item. The frequency values and percentage values are arranged according to the Likert scale from 'Strongly Disagree' to 'Strongly Agree'.

3.1 Demographic Analysis

The demographic information of the respondents analyzed on the questionnaire information for this section is gender, form, school location, race, and past grades of *MPV-KAG* examination. 106 male respondents filled out the questionnaire. In addition, the majority of the study respondents are Malay, which is a total of 104 people, which is equivalent to 98.1%, while Chinese and Indian respondents each have 0.9%, which is equivalent to 2 students.

Table 4 - Population distribution and sample of *MPV-KAG* course students

Demographic Information		Total	Percentage %
Gender	Male	106	100
Form	Four	61	57.5
	Five	45	42.5
School Location	City Area	30	28.3
	Rural Area	76	71.7
Race	Malay	104	98.1
	Chinese	1	0.9
	Indian	1	0.9
	Past Grades of <i>MPV-KAG</i> Examination	A – A+	17
	A-	7	6.9
	B – B+	28	26.4
	B-	5	4.7
	C – C+	38	35.8
	D – D+	6	5.7

3.2 Student Readiness

7 question items are presented to answer the research question, which is are students ready to follow Gas and Arc Welding subjects in daily secondary school stated in Table 5. Overall, the mean value for the readiness of students to follow *MPV-KAG* in daily secondary school is at a high level with a mean value (M=4.11).

Table 5 - Student readiness and average mean of each item

No Item	Statement	Frequency					Average Mean	Standard Deviation	Level
		SD	DA	NS	A	SA			
B1	I have basic knowledge related to practical work and technical skills.	1	3	14	56	32	4.08	0.79	High
B2	I have basic knowledge of this subject at lower secondary school	0	4	19	54	29	4.02	0.78	High
B3	I have seen welding work carried out in school workshops	0	0	2	48	56	4.51	0.54	High
B4	I can identify tools used in welding such as electrodes and welding machines.	0	1	13	37	55	4.38	0.74	High
B5	I always get the latest information before the teacher teaches the topic	0	5	27	41	33	3.96	0.87	High
B6	I always make subject-related references before the teacher teaches related topics.	1	3	35	36	31	3.88	0.90	High
B7	I spent more time to prepare in advance before the start of the teaching session for this subject	3	4	16	55	28	3.95	0.91	High
Average Mean							4.11		High

The item that found the highest mean value is item B3 which is “I have seen welding work carried out in school workshops”. The findings of this study can be supported by the study of Bakar and Ismail (2011) who found that most students are satisfied to be able to relate the topics taught in class to previous experiences. The learning process will become clearer and more meaningful when the elements in the environment can explain why something happened that student want to know. This shows that the majority of students agree that the student readiness can be built through student interaction with the learning environment around them. The findings of this study can be supported by the study of Azizan and Hussin (2017) that existing experiences are able to help students form new knowledge by adapting all new information through an active psychological process. Next, the item that found the lowest mean value is item B6 which is “I always make subject-related references before the teacher teaches related topics”. According to the study of Sahaat & Nasri (2020), that the learning process can be carried out more easily and organized if students make some preparations before the teaching session for a subject start. However, the item is still at a high level despite having the lowest mean value. This shows if a high level of readiness can be trained among students, then it can increase the intellectual development and knowledge of students so that it can create a deep sense of interest to learning. It is also seen as an important aspect in helping students to build and adjust new information to be applied in student learning to be more dynamic and responsive (Voon & Amran, 2021).

3.3 Chances for Students do Activities According to Their Ability

Table 6 shows the seven question items that built based on the chances for students do activities according to their ability during the teaching and learning process during the MPV class. Overall, the mean value for the chances for students do activities according to their ability is at a high level with a mean value (M=4.06).

Table 6 - Chances for students do activities according to their ability and average mean of each item

No Item	Statement	Frequency					Average Mean	Standard Deviation	Level
		SD	DA	NS	A	SA			
C1	I was not pressured by the teacher to do the activities in the Gas and Arc Welding learning module quickly	4	10	13	35	44	3.99	1.13	High
C2	I was not pressured by the teacher to do the activities in the Gas and Arc Welding learning module quickly because other students had already completed the activities	5	10	20	45	26	3.73	1.08	High
C3	I was allowed by the teacher to do Gas and Arc Welding practical activities according to my physical abilities (assembling arc welding machine).	0	2	12	45	47	4.29	0.74	High
C4	I was allowed by the teacher to do activities in the Gas and Arc Welding learning module according to my learning style (fast or slow).	1	2	17	56	30	4.06	0.78	High
C5	I am allowed to redo any part of the difficult Gas and Arc Welding learning module.	1	6	11	46	42	4.15	0.89	High
C6	I was allowed by the teacher to do the next activity in the Gas and Arc Welding learning module only after I completed my final assignment.	0	0	19	43	44	4.24	0.74	High
C7	I was allowed by the teacher to do the next activity in the Gas and Arc Welding learning module even though the other students had not completed their final assignments	0	3	30	41	32	3.96	0.84	High
Average Mean							4.06		High

The item that found the highest mean value is item C3 which is 'I was allowed by the teachers to do Gas and Arc Welding practical activities according to my physical abilities (assembling arc welding machine)'. The findings of this study can be supported by the study of Md. Harun (2014) who found that knowledge and skills are simple components of competence that can be seen and identified in an outstanding student. Therefore, the teacher can identify the skills and knowledge of each student's performance in the classroom or workshop. Next, the item that found the lowest mean value is C2 which is 'I was not pressured by the teacher to do the activities in the Gas and Arc Welding learning module quickly because other students had already completed the activities'. Based on the study of Muttalip (2020), the learning style of students is different because each student has his own tendency and style in deepening the information presented by the teacher during the lesson. Therefore, *MPV - KAG* teachers can apply different teaching which is a method of teaching approach that can meet learning needs

and give equal learning opportunities to every student so that they can learn optimally according to their cognitive level and learning situation (Jawan & Mahamod, 2021).

3.4 Workshop Equipment is Sufficient, Appropriate and Functional

The researcher examine the workshop equipment used in the implementation of the vocational subject of Gas and Arc Welding is sufficient, appropriate and functional in daily secondary schools by presenting 7 question items stated in Table 7. Overall, the mean value for the workshop equipment is sufficient, appropriate and functional is at a high level with a mean value (M=4.29).

Table 7 - Workshop equipment is sufficient, appropriate and functional and average mean of each item

No Item	Statement	SD	Frequency					Average Mean	Standard Deviation	Level
			DA	NS	A	SA				
D1	The space for practical work in the Gas and Arc Welding workshop is comfortable	0	0	1	47	58	4.54	0.52	High	
D2	Hand tools are sufficient to perform all activities in the Gas and Arc Welding module	0	1	5	52	48	4.39	0.63	High	
D3	Machine equipment is sufficient to perform all activities in the Gas and Arc Welding module	4	9	17	45	31	3.85	1.06	High	
D4	All hand tools are appropriate to perform all activities in the Gas and Arc Welding module	1	0	3	59	43	4.35	0.63	High	
D5	All machine tools are appropriate to perform all activities in the Gas and Arc Welding module	0	2	3	59	42	4.33	0.63	High	
D 6	Gas and Arc Welding hand tools are regularly maintained to ensure that they work at all times	0	1	7	54	44	4.33	0.64	High	
D7	Gas and Arc Welding machine equipment is constantly maintained to ensure that it works at all times	0	0	8	64	34	4.25	0.58	High	
Average Mean							4.29		High	

The item that found the highest mean value is item D1 which is 'The space for practical work in the Gas and Arc Welding workshop is comfortable'. The findings of this study can be supported by the study of Liman et al. (2020) who found that the workshop environment can not only improve working efficiency but also reduce the risk of accidents occurring during teaching and learning activities in the workshop. These results support previous research showing that the comfortable practical workshop will be able to increase students' interest in following lessons while also being able to influence the student's level of learning achievement Zainol et al. (2018). In addition, a conducive and comfortable workshop space should be adapted according to the program and have features that are safe for students so that the teaching and learning process runs smoothly and helps students enjoy the activities. Next, the item that found the lowest mean value is item D3 which is 'Machine equipment is sufficient to perform all activities in the Gas and Arc Welding module'. These results show that the equipment and machinery in the workshop must be sufficient and work well so that the syllabus of the subject can be completed within the specified time. This finding different to a study conducted by Raman (2014) who found that MPV machine equipment in 40 academic secondary schools in Peninsular Malaysia was at a moderate level. Therefore, the school needs to improve infrastructure facilities involving machine tools to facilitate the implementation of Gas and Arc Welding subjects in teaching and learning sessions in daily secondary schools.

4. Conclusion

This study has achieved the objective of evaluating the implementation of the Vocational Subject of Gas and Arc Welding in daily secondary schools in Malaysia. The level of student readiness in following *MPV-KAG* is at a high level in the class or workshop. Next, the opportunity for students to do activities according to their ability in the *MPV-KAG* modular teaching method is also at a high level. Finally, the *MPV-KAG* workshop equipment in the secondary school workshop is sufficient, appropriate and functional to meet the needs of the *MPV-KAG* program. Therefore, attention needs to be given to efforts and improving the *MPV-KAG* program so that it can be run more smoothly and effectively in Malaysia. Schools are encouraged to organize study tour programs for students to enable them to gain additional information and skills related to specific MPV subjects. Teachers are also encouraged to seize the opportunity of the MPV teaching technique course organized by the Malaysian Ministry of Education for the purpose of improving the knowledge and skills of teachers in carrying out effective teaching and learning processes.

Acknowledgment

The authors would like to thank the Faculty of Technical and Vocational Education, University Tun Hussein Onn Malaysia for its support.

References

- Albaum, G. (1997). The Likert scale revisited. *Market Research Society. Journal.*, 39(2), 1-21.
- Aziz, N. F. A., Muftah, F., Rahman, N. F. A., & Latib, F. W. M. (2021). Kebolehan pelajar mengaplikasikan keupayaan teori dan praktikal melalui pelaksanaan projek 'fka lateral tower competition'. *Gading Journal for Social Sciences (e-ISSN 2600-7568)*, 24(02), 33-37.
- Azizan, N. S. B., & Hussin, M. S. H. B. (2017). Penguasaan Asas Membaca Bahasa Meleyu Program Linus Di Utara Semenanjung Malaysia: Basic Mastery Of Reading Malay Through The Linus Program In The Northern Area Of Peninsular Malaysia. *Jurnal Pengajian Melayu (JOMAS)*, 28(1), 135-163.
- Bakar, Z. A., & Ismail, N. H. A. (2011). Persepsi Dan Sikap Pelajar Terhadap Pendekatan Konstruktivisme Serta Kesan Terhadap Pencapaian Dalam Mata Pelajaran Matematik Di Fakulti Pendidikan Universiti Teknologi Malaysia. *Journal Of Science And Mathematics Educational*, 3, 92-107.
- Bahagian Pembangunan Kurikulum. (2018). *Kurikulum Standard Sekolah Menengah, Kimpalan Arka dan Gas Tingkatan 4 dan 5*. Kementerian Pendidikan Malaysia 1–76.
- Baharudin, M. A. & Ibrahim, M. A. (2020). Kesediaan Pelaksanaan Pengajaran Abad ke 21 Dalam Kalangan Guru Pelatih Sejarah IPG Zon Selatan. *Jurnal Penyelidikan Sains Sosial*, 2(5), 32–42.
- Haniffa, M. A., Mohamad, A. N. A. & (2018). Survival Orang Melayu Mendepani Arus Revolusi Perindustrian 4.0: Suatu Penelitian Awal *e-Prosiding Persidangan Antarabangsa Sains Sosial dan Kemanusiaan*. Kolej Universiti Islam Antarabangsa Selangor. pp. 1- 15
- Ismail, R., Hamzah, R., & Siang, L. C. (2017). Penentu keterlibatan pekerja dalam latihan: Kes sektor pendidikan swasta di Malaysia. *Geografia-Malaysian Journal of Society and Space*, 11(10), 1–13.
- Jalil, M. A., Hisham, N.J., & Akhmal, A.H. (2015). TEVT di Malaysia : Cabaran dan harapan. *Seminar Kebangsaan Majlis Dekan-Dekan Pendidikan Awam, September*, pp. 340–346.
- Jawan, H., & Mahamod, Z. (2021). Kaedah dan cabaran pengajaran terbeza dalam meningkatkan penguasaan membina ayat Bahasa Melayu murid sekolah rendah. *Jurnal Dunia Pendidikan*, 3(1), 67-77.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610.

- Liman, A., Ismail, Z. & Ahmad, M.H. (2020). Kepuasan Pelajar Terhadap Kemudahan : Kajian Kes di Kolej Komuniti Kuala Terengganu. *Journal Online Jaringan Pengajian Seni Bina*, 21(1), 192-204.
- Md Harun, Z. N. (2014). *Kompetensi guru dalam pengajaran amali reka bentuk dan teknologi di Sekolah Rendah Daerah Batu Pahat*. Universiti Tun Hussein Onn Malaysia: Tesis Ph.D.
- Muttalip, D. A. A. (2020). Pelaksanaan Pendekatan Pengajaran Terbeza Dalam Kalangan Guru Bahasa Melayu Yang Mengajar Di Sekolah Rendah Pedalaman Kategori 3 (The Implementation Ddifferntiated Instruction Approaches among Malay Language Teachers's in Rural Elementary School Category 3). *Jurnal Pendidikan Bahasa Melayu*, 10(2), 29-42.
- Raman, G. (2014). *Penilaian Pelaksanaan Mata Pelajaran Vokasional - Landskap Dan Nurseri (MPV-LN) Di Peringkat Sekolah Menengah Di Semenanjung Malaysia*. Universiti Malaya: Tesis Ph.D.
- Rahman, M. H. A., Marzuki, M., Ali, A. H., Abd Latiff, A. N., & Mokhtar, S. (2022). The Implementation of Co-Curriculum Activities and Facilities in Darul Iman Islamic Primary School (Sridi) in Achieving Educational Excellence in Terengganu State Schoolstitle. *International Journal of Education, Psychology and Counseling*, 7(45), 18–34. <https://doi.org/10.35631/ijepc.745002>
- Sahaat, Z., & Nasri, N. M. (2020). Cabaran pelaksanaan mata pelajaran Reka Bentuk dan Teknologi sekolah Menengah. *Jurnal Pendidikan Malaysia*, 45(1), 51-59.
- Sekaran, U., & Bougie, R. (2014). *Research Methods for Business: A Skill Building Approach*. 6th ed. New York: John Wiley & Sons, Inc.
- Voon, S. H., & Amran, M. S. (2021). Pengaplikasian Teori Pembelajaran Konstruktivisme Dalam Pembelajaran Matematik: Application of Constructivism Learning Theory in Mathematical Learning. *Sains Insani*, 6(2).
- Zainol, N. H., Wahab, A., & Lail, J. (2018). Tahap Kesediaan Komuniti Sekolah terhadap Keberkesanan Program Pendidikan Asas Vokasional di Sekolah. *Selangor Humaniora Review*, 2(2), 1-15.