

**A Survey on the use of principles of Motor Learning among Speech Language  
Pathologist in the USA**

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## **Introduction**

Motor learning refers to a set of processes resulting in a relatively permanent change in the capacity for motor movement (Kaipa & Kaipa, 2018). Motor learning uses a set of processes linked to specific practice or already existing experience, and is used for learning a novel motor movement or relearning a lost motor skill. The initial practice associated with learning a motor movement is the precursor to the actual motor learning and is referred to as the acquisition phase. During the acquisition phase, the individual practices the motor skill with a heightened cognitive load. However, as the individual progresses to learn the motor skill, it is associated with increasingly less focused cognitive processing (Hancock, 2008). Motor learning is typically assessed through retention or transfer tasks.

Principles of motor learning (PMLs) are specific conditions that aid an individual in the process of motor learning. PMLs are typically categorized based on the structure of practice conditions and nature of feedback (Maas, 2008) (Tables 1 & 2). Structure of practice refers to the act of rehearsing a motor skill repeatedly in order to master it (Poole, 1991). The practice structure of a motor movement can vary based on variables such as practice distribution, practice variability, practice amount, practice schedule, source of attention, and task complexity (Bislick et al., 2012). Nature of feedback refers to information that is received related to movement itself (e.g., feel, sound), as well as information associated with the result of the action in relation to the environmental goal (Kawashima et al., 2000). Efficient feedback can be provided based on frequency, type, and timing (Bislick et al., 2012).

<b>Table 1 - Practice Conditions</b>	
<b>Practice Conditions</b>	<b>Options</b>
Practice Amount	Small vs. Large
Practice Distribution	Massed vs. Distributed
Practice Variability	Constant vs. Variable
Practice Schedule	Blocked vs. Random
Attentional Focus	Internal vs. External
Target Complexity	Simple vs. Complex

<b>Table 2 - Feedback Conditions</b>	
<b>Feedback Conditions</b>	<b>Options</b>
Feedback Type	Knowledge of Performance vs. Knowledge of Results
Feedback Frequency	High Frequency vs. Low Frequency
Feedback Timing	Immediate vs. Delayed

Historically, our knowledge of PMLs stems from studies that evaluated limb-based motor learning tasks (Sullivan, Katak, & Burtner, 2008; Soderstrom & Bjork, 2015). However, in the recent past there has been a dramatic shift in the application of PMLs to speech-motor learning in healthy individuals (Adams & Page, 2000; Kaipa, 2016; Kaipa et al., 2017; Scheiner, Sadagopan, & Sherwood, 2014; Steinhauer & Grayhack, 2000) as well as in individuals with speech-motor control deficits (Bislick et al., 2012; Hula et al., 2008; Kaipa et al., 2016; Katz, Carter, & Levitt, 2007; Knock, Ballard, Robin, & Schmidt, 2000; Maas & Farinella, 2012; Maas, Butalla, & Farinella, 2012; McNeil et al., 2010; Namasivayam et al., 2015; Preston & Leaman, 2014; Skelton & Hagopian, 2014).

Despite some inconsistencies, emerging research in this area points to the overwhelming benefits of application of PMLs to facilitate speech motor learning in healthy as well as in clinical populations. For example, Bislick et al. (2012) systematically reviewed multiple studies that provided controlled evidence on the effects of PMLs on speech motor learning in healthy individuals as well as in individuals with speech-motor control deficits. A total of seven studies met the authors' inclusion criteria. Among the seven studies, four studies employed single case experimental designs and the remaining three studies employed randomized control designs. Despite some inconsistent findings among the reviewed studies, the authors noted that the evidence for the application of PMLs in speech production is promising. Similarly, Maas et al. (2008) reviewed several PMLs and their potential role in enhancing speech production. The authors concluded that available evidence holds promise for application of PMLs in treatment of motor speech disorders. Thus, on an overall note, there is empirical evidence to support the use of PMLs to facilitate speech motor learning in healthy individuals as well as in individuals with motor-based speech disorders.

While the aforementioned studies have been critical to understand the role of PMLs to facilitate speech production, it is also important to be aware that most of these studies were carried out in a controlled environment. It is imperative to ensure that the research generated in this controlled environment is implemented in the real world by practicing speech-language pathologists to reap the intended benefits. So, this begs a fundamental question – whether PMLs intended to treat speech disorders are being implemented by practicing speech-language pathologists on a regular basis? Knowledge translation refers to the process through which novel evidence is synthesized and adopted into routine clinical practice (American Speech-Language-

Hearing Association, 2019). An emerging branch of science in healthcare that oversees the process of knowledge translation is the implementation science. To put succinctly, implementation science helps us understand the best mechanisms for moving clinical research findings into routine clinical practice. Implementation science offers a pathway for bridging the gap between clinical research and clinical practice and thereby, advancing evidence-based practice (EBP).

Although the specific strategies involved in implementation science differ across the health professions, they are generally grouped into six sequential categories that include: exploration/planning, educating, financing, restructuring, managing quality, and attending to the policy context. Exploration/planning strategies involve gathering information from the stakeholders such as determining the need for developing an assessment or an intervention program, identifying the barriers for implementation of an intervention program, and looking from the perspectives of clinicians who are implementing an intervention program. Educational strategies include developing materials for an assessment/intervention program, training healthcare providers, and finding ways to monitor learning and performance. Financing strategies involve assessing the cost in implementing a new assessment/intervention program as well as expenses for providing training support to healthcare providers. These three strategies are considered to be vital during the early phases of implementation. Restructuring strategies are typically applied for larger organizations that require organization rearrangement to implement a new program. Quality management strategies tend to focus on data-management systems and support networks to ensure the sustainability in implementing novel programs. Finally, policy

strategies address the dissipation of clinical innovations through national organizations, accrediting agencies, licensure boards, and legal systems (Olswang & Prelock, 2015).

As mentioned earlier the evidence-base for PMLs in speech-language pathology is largely restricted to efficacy-based studies that represent early pipeline research. To promote EBP in this area, it is critical for us to move beyond the efficacy phase and explore opportunities for implementation of PMLs in routine clinical settings. However, to achieve that, one should start with exploring clinical practices of speech-language pathologists pertaining to incorporation of PMLs in routine speech therapy. This would represent the first step of the implementation science and is the focus of the current study. This line of research would help us identify not only the perspectives of practicing speech-language pathologists with regard to implementation of PMLs but also the barriers in successful implementation of PMLs. Hence, it is critical that we understand their clinical practices with regard to PMLs in order to advance implementation science. Considering this, the aim of the current study was to survey practicing speech-language pathologists to understand their perspectives in implementation of PMLs as well as identify barriers in successful implementation of PMLs. The current study surveyed speech-language pathologists who were working in the USA only.

## **Methods**

### **Research Design**

The current study utilized a cross-sectional survey design to address the proposed aim. A cross-sectional design provides a snapshot of a set of characteristics of a specific population or a representative subset and at a specific point of time (Levin, 2006). Survey research uses qualitative or quantitative research strategies or both to elicit appropriate information. There are

several advantages of conducting survey research: (1) they are inexpensive, (2) can gather information from individuals in remote locations, and (3) ideal for gathering information on human behavior in a short amount of time. For these reasons, the current study employed a cross-section survey design to elicit information from speech-language pathologists living in different geographical locations of the USA.

### **Development of the online survey**

The survey was created using Qualtrics<sup>®</sup> software (2019, Provo, Utah). Qualtrics is a web-based software that enables the user to design and administer surveys through a variety of distribution means. The questions for the current survey were designed to elicit specific information concerning how SLPs used PMLs in their routine clinical practice. The survey had 29 questions and took about 15 minutes to complete. The survey questionnaire had a mix of yes/no questions as well as multiple-choice questions. Majority of the multiple-choice questions had an “other” option if the participants wanted to indicate a response other than the listed options. If a participant selected the “other” option, he/she was required to type in a response in the adjacent column.

The first question on the survey provided background information about the survey and solicited response from participants to either consent or decline to participate in the survey. The remaining 28 questions were spread across three sections. The first section of questions focused on the demographic details of the participants, such as their profession, licensure, ASHA certification, nature of work setting, experience, type of clinical population served, and geographic location of their practice. The second section of questions solicited information on the usage of PMLs by speech-language pathologists, and the third set of questions gathered

information from speech-language pathologists who were not aware of PMLs. The survey flow was dependent on the responses provided by the participants. If the participant indicated that he/she was an audiologist, then he/she was directed to the end of the survey with a “thank you” message. Similarly, if the participants indicated that they were not aware of PMLs, then they were directed to the third set of questions.

### **Procedure**

The institutional review board at Oklahoma State University approved the current study. An e-mail was sent to all the Speech-Language and Hearing Associations in the 50 states of the USA, District of Columbia, as well as to the accredited Speech-Language Pathology programs in the USA. The e-mail consisted of an introductory message that requested the recipients to participate in the survey if they had prior/current experience as a practicing speech-language pathologist. The weblink to the survey was embedded in the e-mail message along with information on how to complete the survey successfully. To maximize the response rate, the details of the survey and the link to the survey were posted on ASHA community pages as well on social media pages of different organizations that recruited speech-language pathologists.

### **Data analysis**

The criterion validity of the survey questionnaire was ensured by comparing the current study’s questionnaire to a similar survey questionnaire that had surveyed the implementation of PMLs among physical therapists (Atun-Einy & Kafri, 2018). Five certified speech-language pathologists with work experience ranging from 18-28 years reviewed the content of the questionnaire to ensure it was appropriate for eliciting information regarding implementation of PMLs. This served as a measure of face and content validity. Unfortunately, test-retest reliability



could not be determined as the same set of respondents were unavailable to take the survey again. Descriptive statistics (Mean and Standard Deviation) were used to analyze the data. The participants' responses were aggregated and converted to percentages by the Qualtrics software.

## **Results**

A total of 354 individuals participated in the survey. The actual response rate could not be calculated as we were unable to determine the accurate count of respondents. This is primarily because the survey was distributed through multiple outlets. The obtained data are presented under three categories: demographics, information of the use of PMLs, and information regarding respondents who do not use PMLs.

### **Demographics**

Of the 354 individuals who responded, 334 were practicing speech-language pathologists. The remaining respondents (about 1%) were either audiologists, dual certified, or professors in speech-language pathology programs. With regard to licensure and certification, 95% held licensure in the state that they practiced and 96% held clinical competence certificate from the ASHA. The practice setting of the participants ranged from 4% of the respondents working in skilled nursing facilities to 34 % of the respondents working in schools. About 62% of the respondents had more than 10 years of experience, with only 2% having less than a year of experience. With regard to the clientele served, about 20% served clients with speech sound disorders, , 20% served clients with developmental language disorders, and 18% with motor speech disorders. Clients with resonance disorders were the least common clinical population that was served (4%). In terms of geographical location, about 33% practiced in the Midwest, 29% in the West, 15% in the Northeast, 12% in the South, and 4% in the Southwest. The

demographic information of the respondents is provided in Tale 3.

<b>Table 3 - Demographic details of the participants</b>		
<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
Title of participant		.
SLP	99.11	334
Audiologist	.29	1
Other	.59	2
Hold licensure in the state of practice		
Yes	95.18	316
No	4.82	16
Hold CCC from ASHA		
Yes	96.40	321
No	3.6	12
Nature of work setting		
School	34.86	152
University	20.18	88
Private practice	14.68	64
Hospital	11.93	52
Other	7.80	34
Rehabilitation	6.19	27
Skilled nursing facility	4.36	19
Length of experience		
More than 10 years	62.46	208
5-10 years	15.02	50
1-2 years	7.21	24
4-5 years	6.61	22
3-4 years	6.31	21
0-1 years	2.40	8

**Table 3 - Demographic details of the participants**

<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
Clinical population caseload		
Speech sound disorder	20.06	252
Developmental language disorder	19.59	246
Motor speech disorder	18.31	230
Fluency disorder	10.75	135
Swallowing/Feeding disorder	8.60	108
Voice disorder	7.40	93
Adult language disorder	6.93	87
Other	4.46	56
Resonance disorder	3.90	49
Geographical location		
Midwest	33.03	109
West	28.79	95
Northeast	14.85	49
South	12.42	41
Other	7.27	24
Southwest	3.64	12

### **Participants who were aware of and used PMLs**

In order to gain a better insight of practice patterns of speech-language pathologists , the results of the following aspects that are relevant to the aim of study are presented: awareness of PMLs, use of PMLs in clinical practice , length of using PMLs in clinical practice, clinical population for which PMLs were used, types of PMLs used in therapy, and clinicians' perspectives on the outcomes of using PMLs , potential barriers in using PMLs in therapy, and suggestions to improve the clinical application of PMLs.

#### *Awareness of PMLs*

A majority of the participants (72%) indicated that they were aware of what PMLs are. When asked about the specific of PMLs, practice amount had the highest awareness with 15% and attentional focus had the lowest awareness at 7%.

#### *Use of PMLs in a clinical setting*

A majority of participants (91%) indicated that they do use PMLs in their practice.

#### *Length of using PMLs*

With regard to the length of using PMLs in their practice, a small number of participants (8%) reported using PMLs for one year or less. About 14% indicated they had been using PMLs for two to three years, 11% for three to four years, 12% for four to five years, 23% for five to ten years, and the largest percentage of people (31%) reported using PMLs for over ten years.

#### *Clinical populations for which PMLs were used*

A large number of the participants (34%) reported that they were using PMLs to treat motor speech disorders, with speech sound disorders (30%) being the next largest group. Other populations like swallowing/feeding disorders (9%), voice disorders (7%), developmental language disorders (6%), resonance disorders (3%), fluency disorders (3%) and various other disorders (4%) were represented in somewhat even numbers, with adult language disorders being reported with the lowest usage (2%).

#### *Types of PMLs used*

Practice amount had the largest percentage (16%) of participants using it. Target complexity (13%), feedback frequency (12%), feedback type (12%), practice distribution (12%), practice variability (11%), practice schedule (10%), and feedback timing (9%) all had roughly similar

usage percentages, all falling within 4% of each other. Attentional focus had the lowest number of participants using it in therapy (5%).

#### *Outcome of PML usage*

A majority of the participants (66%) found that they were satisfied with the outcome of PMLs in therapy. Roughly a third (33%) found that they had mixed outcomes from using PMLs, and less than one percent found that they have seen either minimal improvement or no improvement from using PMLs.

#### *Use of PMLs in the future*

Most of the participants (75%) said they plan on always using PMLs in the future. 24% said they will occasionally use PMLs, and we had 0% of the participants say they are opposed to using PMLs. Majority of the participants found that there is sufficient evidence for PMLs to be used in therapy (92%), but only 41% said that current practicing SLPs actually use PMLs in their therapy. Suggestions to increase the use of PMLs ranged from 30% wanting more CEUs and training offered, to 27% wanting an increased awareness of clinical application among SLPs, to 21% wanting to incorporate information on PMLs in CDS academic programs, to 20% wanting more research on application of PMLs in speech therapy. The responses of the participants who indicated they use PMLs in their practice are presented in table 4.

***Table 4 - Information of practicing speech-language pathologists who used PMLs***

<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
<b>Aware of PMLs</b>		
Yes	72.12	238
No	27.88	92

<b>Table 4 - Information of practicing speech-language pathologists who used PMLs</b>		
<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
<b>Aware of Specific PMLs</b>		
Practice amount	15.24	196
Feedback type	12.36	159
Target complexity	11.90	153
Practice distribution	11.28	145
Practice variability	11.20	144
Feedback frequency	10.96	141
Practice schedule	10.50	135
Feedback timing	9.18	118
Attentional focus	7.39	95
<b>Where was PML awareness acquired</b>		
College education	30.93	120
Attending CEUs	28.87	112
Reading journal articles	24.74	96
ASHA magazine	7.99	31
Other	7.47	29
<b>Did professors speak about PMLs</b>		
Yes	57.55	122
No	42.45	90
<b>Use PMLs in practice</b>		
Yes	90.61	193
No	9.39	20
<b>Length of PML use in practice</b>		
More than 10 years	31.58	54
5-10 years	23.39	40
2-3 years	14.04	24
4-5 years	12.28	21
3-4 years	10.53	18
0-1 years	8.19	14

<b>Table 4 - Information of practicing speech-language pathologists who used PMLs</b>		
<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
<b>What clinical population uses PMLs</b>		
Motor speech disorders	34.49	129
Speech sound disorders	29.95	112
Swallowing/feeding disorders	8.82	33
Voice disorders	7.49	28
Developmental language disorder	6.15	23
Other	4.28	16
Resonance disorder	3.48	13
Fluency disorder	2.94	11
Adult language disorder	2.41	9
<b>What PMLs are used in practice</b>		
Practice amount	15.67	152
Target complexity	12.58	122
Feedback frequency	12.47	121
Feedback type	12.37	120
Practice distribution	11.86	115
Practice Variability	11.44	111
Practice schedule	9.69	94
Feedback timing	8.76	85
Attentional focus	5.15	50
<b>Regarding PMLs</b>		
I am satisfied with the outcome of PMLs	66.08	113
I have obtained mixed outcomes using PMLs in my therapy sessions	32.75	56
I have seen minimal improvement in my clients using PMLs	.58	1
Use of PMLs do not seem beneficial in speech therapy	.58	1

<b>Table 4 - Information of practicing speech-language pathologists who used PMLs</b>		
<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
<b>Using PMLs in the future</b>		
I will always continue to incorporate PMLs in my therapy sessions	75.29	128
I will occasionally plan to incorporate PMLs in my therapy sessions	24.71	42
I do not want to incorporate PMLs in my therapy sessions	0	0
<b>Which clinical population benefits using PMLs</b>		
Motor speech disorders	32.65	144
Speech sound disorders	27.66	122
Swallowing/feeding disorders	9.98	44
Voice disorders	7.94	35
Fluency disorders	5.90	26
Resonance disorders	4.76	21
Developmental language disorders	4.08	18
Other	3.85	17
Adult language disorders	3.17	14
<b>Think there is evidence to use PMLs in therapy</b>		
Yes	91.57	152
No	8.43	14
<b>Do you feel SLPs incorporate PMLs in therapy</b>		
No	58.54	96
Yes	41.46	68
<b>Other hurdles in incorporating PMLs in therapy</b>		



**Table 4 - Information of practicing speech-language pathologists who used PMLs**

<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
<b>How to improve future use of PMLs in therapy</b>		
Offer CEUs/training on ways of incorporating PMLs in speech therapy	29.67	143
Create increased awareness of clinical application of PMLs among SLPs	26.76	129
Incorporate information on PMLs in CDS academic programs	20.75	100
Conduct more research on clinical application of PMLs	20.33	98
Other	2.49	12

### **Participants who did not use PMLs**

With regard to the participants who did not use PMLs, the results of the following aspects that are relevant to the study are reported: reasons for not using PMLs in their practice, if there is sufficient evidence for the use of PMLs in therapy, and factors that could encourage the use of PMLs in therapy.

#### *Reason for not using PMLs*

Of the participants that did this survey, 9% said they do not use PMLs in their therapy. Out of that group, 42% want to incorporate PMLs but are not sure how to do so. That was the main reason for not using PMLs, with the collective 'other' choice making up 38%. Some of those reasons included PMLs requiring more repetition than young children are capable of, the SLP is using AAC in therapy, or the SLP thought that motor learning does not lend itself to

neursemantic circuits in high level of learning. Unawareness of PMLs (9%) and lack of evidence for PMLs improving speech deficits (9%) made up the rest of the group.

*Thoughts on evidence for the use of PML*

Of the 9% that does not use PMLs in their practice, 65% of that group think that there is sufficient evidence for the continued use of PMLs in speech therapy, while 35% think there is not sufficient evidence. When asked about considering the incorporation of PMLs in therapy sessions, 86% said they would consider using PMLs and 14% said they would not consider using PMLs.

*Factors that would encourage consideration of using PMLs*

Out of the participants who do not use PMLs, 37% said that personal success while using PMLs in therapy would encourage them to use PMLs. Published evidence on the benefits of PMLs in speech therapy would encourage 32%, and an increase in the number of SLPs using PMLs would encourage 18%. Almost 11% mentioned various other methods, and 3% said they will never consider using PMLs. The responses of the participants who did not use PMLs are presented in table 5.

<b>Table 5. Information on practicing speech-language pathologists who did not use PMLs</b>		
<b>Findings</b>	<b>Response (%)</b>	<b>Response (#)</b>
<b>Reasons for not using PMLs</b>		
I want to incorporate PMLs but I am not sure if I know how to do so	42.86	9
Other	38.10	8
Not aware of what PMLs are	9.52	2
There is lack of evidence for the role of PMLs in improving speech deficits	9.52	2
I have attended continuing education events about PMLs, and found PMLs not to be useful	0	0
<b>Evidence for the use of PMLs in speech</b>		
Yes	65.00	13
No	35.00	7
<b>Consider using PMLs in therapy?</b>		
Yes	85.71	18
No	14.29	3
<b>What would help to use PMLs</b>		
Personal success of using PMLs in therapy sessions	36.84	14
Published evidence on the benefits of PMLs in speech therapy	31.58	12
An increase in the number of SLPs using PMLs	18.42	7
Other	10.53	4
I will never consider incorporating PMLs	2.63	1

## Discussion

The application of PMLs to facilitate speech motor learning has garnered strong evidence in the recent past. However, this evidence stems from studies that were conducted in a controlled evidence. It is important to evaluate the feasibility of implementing the PMLs in the real world. This would be the first step among the several steps of implementation science. The current study addressed this by surveying the practice patterns of perceptions of implementing PMLs among practicing speech-language pathologists.

On an overall note, the findings indicated that most of the practicing speech-language pathologists were aware of PMLs and tend to implement in their therapy on a routine basis. The survey indicated although most of the PMLs were used to a similar extent, practice amount was used by a greater number of speech-language pathologists. This is not surprising considering the emerging evidence related to practice among in speech-language pathologist (Kaipa & Peterson, 2016). The findings also revealed that PMLs were most frequently used to treat speech sounds disorders and motor speech disorders. This is suggestive that the practice patterns of speech-language pathologists mirror the empirical evidence as PMLs have been found to be most effective in treating these two clinical populations. A majority of the speech-language pathologists felt satisfied about the incorporation of PMLs in their therapy sessions and expressed an interest to implement PMLs in future as well. An overwhelming amount of the speech-pathologists agreed that there is sufficient evidence for use of PMLs in routine clinical care. This suggests that the speech-language pathologists are able to achieve the desired outcomes in their therapy as a result of incorporation of PMLs. However, more than half of the respondents indicated that most of the speech-language pathologists do not incorporate PMLs

and the barriers for implementing PMLs ranged from lack of training to size of the caseload. Most the speech-language pathologists who responded to the survey indicated the need for additional training (e.g. CEUs) to develop their clinical skills in implementing PMLs.

With regard to speech-language pathologists who did not incorporate PMLs, the main reason that was indicated was the lack of training. In fact, many indicated that there was sufficient evidence for implementation of PMLs in routine speech therapy. A small number of speech-language pathologists indicated that they would like to see additional evidence for the outcomes of PMLs in speech therapy.

The current survey findings suggest that PMLs are not only perceived favorably by practicing speech-language pathologists but also implemented on a regular basis. While it is a bit premature to indicate that PMLs pass the first litmus test of implementation science, there is an indication that PMLs are regularly implemented in clinical care. The next step would be for clinical researcher to assess the efficacy of PMLs by documenting the efficacy of outcomes of PMLs in the real world. However, a major challenge with this is the treatment fidelity. Speech language pathologists would find it challenging to implement PMLs with complete rigor without appropriate training, thereby affecting the treatment fidelity. Therefore, it is important to provide CEUs to practicing speech-language pathologists with regard to implementation of PMLs in routine speech therapy. Ensuring this would help us to move past the first step of implementation science.

### **Limitations**

There are obviously some limitations in the current study. First, the survey was not extensive to capture the input of all the practicing speech-language pathologists in the USA. Second, the

responses were provided by speech-language pathologists with a broad range of clinical experience. It is possible that the implementation of PMLs would have differed based on the speech-language pathologists' experience. Finally, the survey did not solicit information on treatment fidelity, which is an integral component of implementation science.

### **Conclusion**

The findings of the current survey suggest that practicing speech-language pathologists find it encouraging to implement PMLs in their routine practice. However, it is important for them to receive appropriate training so that they implement PMLs in a methodical fashion which would be helpful in tracking the treatment outcomes. As a profession, we should start focusing on the next step of implementation which would be educating the broader population of speech-language pathologists regarding the beneficial aspects of implementation of PMLs. This would eventually pave way to implement PMLs on broader level.

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