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Practice and Recommendations for Universal Design for Learning in Occupational Therapy Client Education

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Abstract

Background: Universal Design for Learning (UDL), an educational framework that describes flexible approaches to teaching and learning, can be used to address problems related to limitations in health literacy in health care settings.

Methods: This exploratory observational study, using a web-based online survey, was undertaken to discern how occupational therapists use the principles of UDL in educating their clients and to determine if differences exist between degree type or practice settings and UDL implementation.

Results: Of the 147 respondents only 30.6% indicated prior awareness of UDL principles. The most frequently cited means of client engagement were displaying enthusiasm and emphasizing importance of content; the most frequently cited means of representation was providing verbal instructions, and the most frequent means of action and expression was observing client performance or demonstration.

Conclusions: There is a clear need to increase both academic preparation and continuing education of occupational therapists to implement evidence-based principles of UDL to address diverse client health literacy and facilitate positive health outcomes. Opportunities for increased UDL implementation are discussed, building on the commitment of current therapists to meet the needs of their clients.

Comments

The authors declare that they have no competing financial, professional, or personal interest that might have influenced the performance or presentation of the work described in this manuscript.

Keywords

universal design for learning, patient education, occupational therapy patient education, client education

Credentials Display

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The concept of Universal Design for Learning (UDL) is rooted in Universal Design (UD), an architectural notion that emerged during the 1990s, supported by the passage of the Americans with Disabilities Act (ADA National Network, n.d.). Just as UD aims to make products and physical environments accessible to all, UDL aims to make learning accessible to all, regardless of age, ability, or situation (Center for Applied Special Technology [CAST], n.d.; Meyer et al., 2014). More specifically, UDL is an educational framework that supports flexible approaches and activities throughout the teaching and learning process. The framework benefits diverse learners by providing guidelines for the educator to use when developing curriculum, selecting instructional methods, and creating educational materials (CAST, n.d.).

The UDL framework is based on three key principles to foster a dynamic and effective learning process. These principles describe multiple means of engagement, representation, and action and expression in the teaching and learning process. Specifically, the principle of engagement relates to the affective networks of the brain to address the *why* of learning. Activities for learning must recruit interest, promote sustained effort, and facilitate learner self-regulation (CAST, n.d.; Meyer et al., 2014). The principle of representation addresses the recognition networks of the brain to address the *what* of learning. Information must be delivered through multiple perceptive networks (such as movement or touch), through shared language and symbols, and with the intent to allow the learner to construct meaning and comprehension (CAST, n.d.; Meyer et al., 2014). Finally, the principle of action and expression relates to the strategic networks of the brain to address the *how* of learning. Learners should demonstrate what they know through physical actions, various tools for expression and communication, and develop executive functions that promote the management of new information (CAST, n.d.; Meyer et al., 204). The goals of UDL are to eliminate inaccessibility and inequities in the learning process by creating challenging learning opportunities for all, thereby developing expert learners who are purposeful and motivated, resourceful and knowledgeable, and strategic and goal-directed (CAST, n.d.; Meyer et al., 2014). Using UDL strategies may significantly reduce the need for accommodations for learners with diverse needs, ultimately facilitating learning for all.

The principles of UDL were initially used in K-12 school systems to improve the learning outcomes of all students rather than to modify the curriculum for those students with identified learning disabilities (Edyburn, 2010; Edyburn, 2021; Kortering et al., 2008; Post, 2015). The use of the UDL framework has proliferated into higher education and has been applied in a variety of disciplines, such as nursing (Coffman, 2022), laboratory sciences (King-Sears et al., 2015; Miller & Lang, 2016), and special education (Scott et al., 2015). The applicability of the UDL framework has created opportunities to facilitate effective learning in various contexts throughout higher education. However, these principles have not been fully used or studied outside of formal educational systems. In the health professions, an opportunity exists to explore UDL in a naturalistic setting. Understanding what occupational therapists know about UDL, or how they may currently use the framework, has the potential to improve client learning outcomes.

The Need for Better Health Literacy and Client Education

Health literacy has historically been described as the ability of individuals to understand basic health information to support effective health care decision-making (Agency for Healthcare Research & Quality, n.d.). A client's health literacy is directly related to health outcomes, especially when the client has a chronic illness (Eckman et al., 2012; Smith & Gutman, 2011). "There is a large and growing body of literature documenting the adverse consequences of inadequate health literacy, including decreased

screening and preventative services and decreased compliance with treatments" (Ibrahim & Nair, 2021, p. 869). A broader understanding of health literacy must include the individual's abilities , the context in which information is shared, and the communication skills of the professional offering the information (American Occupational Therapy Association [AOTA], 2017; Pleasant et al., 2016). As part of the national Healthy People 2030 initiatives, health literacy is described within a societal, systems-based approach, in which accurate health information and services must be readily available for members of that society to find, understand, and use in decisions that influence their health (Santana et al., 2021). It is estimated that 47% of the US population has limited health literacy and, therefore, has difficulty understanding medical information (Kutner et al., 2006). There is also evidence that people with low health literacy may retain only 50% of what they are told by health professionals (McCarthy et al., 2012). Poor communication and decreased understanding of health information may lead to non-compliance with medical advice, increased risk for medical complications, and hospital readmissions (Glick et al., 2019; Kornburger et al., 2013; Negarandeh et al., 2013). Low levels of health literacy are considered a global problem, particularly for minority populations; therefore, strategies to improve client-provider communication practices have been recommended (Ibrahim & Nair, 2021; Pitts & Freeman, 2021).

Greater understanding and integration of health literacy are relevant to occupational therapists, as they facilitate clients' function, participation, and empowerment through education and interventions (Lavasseur & Carrier, 2012). In addition, occupational therapists are part of the health care system that bears the responsibility of organizational health literacy in the provision and accessibility of health information. Awareness of client barriers to literacy, such as limited reading and writing levels, lack of knowledge of health behaviors and skills, living with stigma and disabilities, and diverse belief systems, must be considered in occupational therapy practice to ensure effective client education (Lavasseur & Carrier, 2012). Ultimately, it is incumbent on occupational therapists to make their knowledge and services accessible to clients through effective communication skills and instructional strategies. Educational materials must match clients' reading and comprehension skills; be delivered in clear, simple, culturally sensitive, and supportive contexts; and incorporate meaningful interventions to close the literacy gap (AOTA, 2017; Lavasseur & Carrier, 2012).

UDL in Medicine

UDL principles are slowly expanding into the health care arena to facilitate client understanding. One strategy nurses use, consistent with action and expression in UDL, is the teach-back method, which ensures client understanding of information, such as discharge instructions (Kornburger et al., 2013). The teach-back method includes teaching new information, asking the client to repeat it in their own words, clarifying or correcting information, and again asking the client to repeat until learning is accurate and complete. Kornburger et al. (2013) determined that 98% of nurses surveyed thought that teach-back was an effective strategy to increase client understanding. However, the strategy was not used consistently because of the time demands of the process, high client-to-nurse ratios, and busy schedules.

The use of pictorial images or teach-back strategies, supportive of multiple means of both representation and action and expression, was found to be equally effective in addressing the needs of diabetic clients with low health literacy (Negarandeh et al., 2013). In a randomized controlled trial, participants who received three 20-min education sessions using either a pictorial handout or teach-back strategies were more effective in increasing diabetes knowledge, medication adherence, and diabetic diet implementation than those who received usual care (Negarandeh et al., 2013).

Self-help booklets, based on cognitive behavioral therapeutic principles, were used to combat anxiety in the incarcerated population (Maunder et al., 2009). In this delayed intervention randomized controlled treatment design, the self-help materials included specific exercises, self-reflection, and a time diary to record use. Results indicated that customized self-help materials reduced symptoms of anxiety in this population (Maunder et al., 2009). Although the self-help booklets were not based on the principles of UDL, they were customized based on feedback from inmates, thus addressing the needs of the learners.

Educational supports used to prepare children facing procedures requiring sedation used UDL principles in a study conducted by Benjaminsson et al. (2015). Using both pictures and text in visual schedules before and during hospital visits significantly reduced stress about upcoming needle-related procedures requiring nitrous oxide sedation. Pain associated with the procedure was also lowered, but not to statistical significance (Benjaminsson et al., 2015).

UDL in Occupational Therapy

Although UDL has been studied in health care settings, it has been minimally explored in occupational therapy literature. School-based occupational therapy practice has been the predominant area of practice examined. The tenets of UDL were embedded into a model called Partnering for Change that included relationship building between students, parents, educators, and therapists; differentiated instruction for students; and accommodating instruction based on student needs (Missiuna et al., 2012). This model focused on creating a therapeutic environment for children with a specific movement disorder rather than providing individual treatment. This environment, based on the tenets of UDL, was found to increase teacher knowledge, empower parents, and integrate rehabilitation principles to ultimately meet the needs of all students (Missiuna et al., 2012).

The role of school-based rehabilitation professionals in occupational and speech therapies has also been investigated. A scoping review by Kennedy et al. (2018) revealed that although many professionals are beginning to use UDL terminology, their practice approaches are inconsistent with UDL guidelines. This study concluded that richer descriptions of interventions using UDL are needed for translation into practice (Kennedy et al., 2018).

Initial research into using UDL principles in occupational therapy education programs has identified frequently used methods of engagement, representation, and action or expression used in the professional preparation of occupational therapists and occupational therapy assistants (Murphy et al., 2020). However, as occupational therapy faculty are not well-versed in the principles of UDL, they are typically not educating future professionals in using UDL with their own clients. Clinical relevance and use of UDL principles in occupational therapy practice have not been addressed.

Therefore, this study was undertaken to lay the foundation for further research in the use of UDL by occupational therapists in clinical settings as a means to improve organizational health literacy and the personal health literacy of occupational therapy clients, to support positive health outcomes. The primary purposes of this study were to determine (a) what occupational therapists know about UDL (awareness), (b) how occupational therapists incorporate UDL principles in their clinical practice (intention and practice), (c) if relationships exist between professional credentials (i.e., occupational therapist or occupational therapy assistant) and UDL use, and (d) if differences exist between occupational therapists' background or practice settings and use of UDL principles. This broader understanding of occupational therapists' awareness and practice of UDL techniques can assist in identifying methods to improve client educational practices.

Method

This exploratory, observational study examined how certain factors or characteristics of occupational therapists were associated with the awareness, understanding, and use of UDL in clinical practice.

Instrument

A web-based survey was developed at a university in the southeastern United States to gather needed data. The survey gathered demographic data, including the type of practitioner (occupational therapist or occupational therapy assistant), highest degree earned, years in practice, practice area (type of service provided or type of client served), and practice setting (environment in which services were delivered). The respondents were asked to indicate their awareness of UDL and to identify an accurate definition of the framework. Then, tables indicating types of engagement, representation, and action or expression were provided with a modified Likert 5-point scale to indicate the frequency of use of each item (1 = *never* to 5 = *always*). The survey included a section under each UDL principle in which the respondents could insert text to capture additional strategies not listed in the survey but used in practice (see Tables 1, 2, and 3).

Table 1
Sample Survey Question for Means of Engagement

Please indicate how you engage clients in the learning process	Never/Rarely/Sometimes/Frequently/Always/Not Sure
I display enthusiasm for the content	
I emphasize the importance of the content	
I make games out of the activities	
I incorporate the education into occupational performance	
I engage the client in setting goals	
I include family, caregiver, or other support system	
I use positive reinforcement or incentives	
I ask them to demonstrate the activity	
I engage the client in solving problems	
I relate the concepts to a real-life situation	

Table 2
Sample Survey Questions for Means of Representation

Please indicate how you provide information to clients	Never/Rarely/Sometimes/Frequently/Always/Not Sure
Verbal instructions	
Handout created on-site	
Handout created by outside company (not altered by clinician)	
Handout created / modified by clinician from purchased source	
Handout modified by clinician from online source	
Pictures combined with text on handouts	
Video instructions	
Websites (informational)	
Pre-intervention classes	
Community agency resources	

Table 3
Sample Survey Questions for Means of Action and Expression

Please indicate how you ensure clients understand information	Never/Rarely/Sometimes/Frequently/Always/Not Sure
Ask them if they understand	
Ask them to verbalize	
Ask them to demonstrate	
Observe during interventions or activities	
Ask them to write information	
Repeat information over multiple sessions	
Teach small amount of information at a time	
Family / caregiver training	
Ask caregiver to verbalize	
Teach-back strategies	

Procedures

To increase face validity, we developed a pilot survey and sent it to 40 occupational therapists who worked at fieldwork sites frequently used by the university at which the survey was developed. These were chosen because of familiarity with the fieldwork sites in anticipation of a high response rate. A variety of practice settings were included in the pilot survey to identify potential survey problems. Nineteen pilot surveys were returned, indicating a response rate of 47.5%. Subject experts reviewed the pilot survey and preliminary results, resulting in minor changes in wording and formatting for clarity. Because of these changes, pilot data were not included in the final analysis.

Following IRB approval, the revised web-based survey was launched and promoted through an online message board sponsored by a national occupational therapy professional association as well as the research team's social media accounts. Responses were anonymous; however, the participants were offered the opportunity to provide contact information if they wished to know more about the results and future research endeavors regarding UDL.

Data Analysis

Descriptive statistics from the survey's demographic section identified the respondents' background and characteristics, as well as their understanding and definition of UDL. Ordinal data identified the frequency of use; means of engagement, representation, and action or expression were converted to continuous data to provide measures of central tendency and to allow for more robust statistical analysis (Norman, 2010; Sullivan & Artino, 2013). Chi-square tests for associations were considered but could not be completed as necessary assumptions were not met (i.e., violation of minimum cell counts). One-way analysis of variance (ANOVA) and Tukey's post hoc comparisons identified statistically significant differences between occupational therapists' use of UDL principles in client education based on their background, credentials, and practice settings.

Results

Participants

Both occupational therapists and occupational therapy assistants were invited to participate in the survey. Since the surveys were not distributed to individuals, a response rate could not be calculated. One hundred and sixty-two surveys were submitted, which included 147 complete responses used for data analysis. The majority of the participants were occupational therapists (n = 108, 73.5%); all remaining respondents were occupational therapy assistants (n = 39, 26.5%). More than half of the occupational therapists (54.5%) had earned a master's degree, while 6.1% had earned doctorates (n = 6 clinical doctorates, n = 3 research doctorates). One-way analysis of covariance (ANCOVA) revealed no significant differences between occupational therapists and occupational therapy assistants in their knowledge and use of UDL (p < .05). Therefore, the results and conclusions will be explained using the term occupational therapist to include all survey respondents. More than half of the respondents (52.4%) had worked in the field between 1 and 7 years. The largest percentage of occupational therapists (69.4%) represented practice areas of rehabilitation and disability or gerontology and productive aging. The most represented practice setting was skilled nursing facility and subacute care (30%) (see Table 4).

Awareness of UDL Principles

Occupational therapists' understanding of the UDL framework and satisfaction with client education materials was important in determining intent to facilitate positive client health outcomes resulting from education. Only 30.6% of the respondents indicated awareness of UDL, but 42.9% correctly chose an accurate definition of UDL from five possible choices. Satisfaction with current client education

materials was reported by 53.8% of the respondents, while 27.3% were neither satisfied nor dissatisfied, and 19% were dissatisfied. Given the lack of awareness of UDL principles, it can be assumed that most client education materials were created or adopted without deliberate consideration of UDL.

Table 4
Participants

	n	%
Practitioner Type		
OTR	108	73.5
COTA	39	26.5
Highest Degree Earned		
Doctorate	9	6.1
Master's	80	54.5
Bachelor's	31	21.1
Associate's	27	18.4
Years in Practice		
Less than 1 year	13	8.8
1–3 years	40	27.2
4–7 years	37	25.2
8–11 years	15	10.2
12–15 years	6	4.1
16–20 years	13	8.8
21 years or more	23	15.6
Primary Practice Area		
Rehabilitation and disability	76	51.7
Productive aging and gerontology	26	17.7
Children and youth	25	17.0
Other	20	13.6
Primary Practice Setting		
SNF/Subacute	45	30.6
Inpatient acute care	28	19.0
Outpatient	18	12.2
Home care	15	10.2
Inpatient rehabilitation	14	9.5
School systems	14	9.5
Other	13	8.8

Intention and Practice of UDL Principles

To further explore the use of engagement, representation, or action and expression, both descriptive and inferential analysis was conducted.

Multiple Means of Engagement

The most frequently reported methods to engage clients in occupational therapy client education were displaying enthusiasm for the content (98.62%), emphasizing the importance of what was being taught to impart the significance of the learning (95.2%), and asking the client to demonstrate what was learned (95.2%) (see Table 5).

The results of one-way ANOVA and Tukey's post hoc testing revealed significant differences in the occupational therapist characteristics and use of UDL principles in practice (see Table 6). The early career occupational therapists, specifically those with 1 to 7 years of experience, made games out of the interventions to engage clients significantly more than the therapists who had 21 or more years of experience. The practice area, described as the type of service provided or the type of client served, also influenced this means of engagement. The occupational therapists working with children and youth made games out of the intervention activities significantly more than those working in gerontology and productive aging or in the rehabilitation and disability areas.

Conversely, the occupational therapists working in gerontology and productive aging or the rehabilitation and disability practice areas used three engagement strategies significantly more than those working with children and youth, namely engaging the clients in setting goals, engaging the clients in solving problems, and relating concepts to real-life situations. This is appropriate for adult clients, who may need more involvement in the learning process to facilitate the meaning of the information and its application to daily life skills.

Multiple Means of Representation

The most common means of providing information to clients was through verbal instructions (98.6%) and using handouts that included both pictures and text to convey information (79.6%). The use of handouts that were created on-site by the occupational therapists was third but used by less than half of the respondents (47.6%) (see Table 5).

ANOVA and post hoc analysis identified only one statistically significant difference in the type of representation for client education based on the respondents' background (see Table 6). Specifically, the occupational therapists working in outpatient settings used handouts created onsite significantly more than those working in skilled nursing facilities or schools. Clients who attend outpatient therapy are usually tasked with completing certain aspects of their therapy programs at home between therapy sessions, in contrast to clients in skilled nursing facilities who receive skilled care directly supervised by health care personnel. However, creating these handouts may not be time efficient in schools, and parents may miss these handouts to promote carry-over between sessions when they are included in potentially crowded and disorganized backpacks brought home by their children.

Multiple Means of Action and Expression

The most common methods that the occupational therapists used to determine the level of understanding by clients following education were to observe the client during the interventions or activities that required them to use learned information (97.3%), ask the client to demonstrate the skills that were taught (94.6%), and ask the client if they understood what was being taught (87.7%) (see Table 5).

Table 5

Most Frequent Uses of UDL in Client Education by Occupational Therapists

	Frequency (%)	Mean	SD
Means of Engagement			
Display enthusiasm for content	98.6	4.52	0.59
Emphasize importance of content	95.2	4.77	0.46
Ask the client to demonstrate the activity	95.2	4.45	0.59
Means of Representation			
Verbal instructions	98.6	4.74	0.47
Pictures and text on handouts	79.6	3.77	0.79
Handouts created on-site	47.6	3.37	0.85
Means of Action and Expression			
Observe client during interventions or activities	97.3	4.62	0.59
Ask the client to demonstrate the activity	94.6	4.50	0.62
Ask the client if they understand	87.7	4.43	0.85

ANOVA and post hoc analysis again identified only one statistically significant difference in the type of action or expression of client education based on respondent background (see Table 6). Specifically, the occupational therapists working in outpatient settings asked their clients if they understood the information more often than those working in inpatient acute care. This may be a result of the increased responsibility of clients living in the community to adhere accurately to therapy interventions and recommendations.

Table 6

Differences in Occupational Therapists' Characteristics and Use of UDL

	ANOVA		Tukey (Post-Hoc)	
	F	***p***	**Difference**	***p***
Methods of Engagement				
Years of Experience and Making Games out of Activities	2.93	.01*		
1–3 years of experience > 21+ years of experience			.97	.01*
4–7 years of experience > 21+ years of experience			.81	.04*
Practice Area and Making Games out of Activities	14.93	< .01**		
Children/Youth > Rehabilitation/Disability			1.40	<.01**
Children/Youth > Productive Aging			1.12	<.01**
Practice Area and Engage Client in Setting Goals	7.58	< .01**		
Gerontology/Productive Aging > Children/Youth			.86	<.01**
Rehabilitation/Disability > Children/Youth			.83	<.01**
Practice Area and Engage Client in Solving Problems	5.13	< .01**		
Productive Aging > Children/Youth			.573	<.01**
Rehab/ Disability > Children/Youth			.472	.04*
Practice Area and Relate Concepts to Real-life Situation	7.72	< .01**		
Productive Aging > Children/Youth			.693	<.01**
Rehab/Disability > Children/Youth			.663	<.01**
Methods of Representation				
Practice Setting and Use of Onsite Handouts	2.78	.01*		
Outpatient > SNF			.74	.02*
Outpatient > School Systems			.94	.02*
Methods of Action / Expression				
Practice Setting and Ask if Client Understands	2.43	.03*		
Outpatient > Inpatient acute care			.67	.05*

$*p \leq .05.$ $**p < .01$

Discussion

    The main purposes of this study were to discern occupational therapists' awareness of UDL and their practice of UDL in client education. In addition, relationships between the type of practitioner (occupational therapist or occupational therapy assistant) or practice settings and use of UDL were examined. While UDL has been supported as an effective way to address varying levels of health literacy in some medical practices (Benjaminsson et al., 2015; Kornburger et al., 2013; Maunder et al., 2009; Negarandeh et al., 2013), this has not been the case in occupational therapy practice outside of school settings (Kennedy et al., 2018; Missiuna et al., 2012).

Awareness of UDL in Clinical Practice

    As only 30.6% of the respondents reported awareness of UDL, the intention with which UDL principles were used is questionable. Therefore, the ability to implement the tenets of UDL that support personal and organizational health literacy and thereby support the achievement of relevant occupational therapy goals is not an intentional practice. When occupational therapists do not seek out multiple ways to support client learning, the risks of non-compliance and poor health outcomes that results from limited health literacy cannot be prevented (Glick et al., 2019; Kornburger et al., 2013; Negarandeh et al., 2013). However, the tenets of UDL are not included in occupational therapy educational preparation (Murphy et al., 2020), thereby putting these professionals at a disadvantage once they enter practice.

    Only 53.8% of the study respondents indicated satisfaction with their current client education materials. While there is dedication to meeting clients' needs in holistic, client-centered practice, the needs of occupational therapists regarding client education materials are not being met. Improved client

education materials and the use of the UDL framework have the potential to deliver improved client outcomes.

Although the teaching and learning process is addressed in academic preparation of occupational therapists, the principles of UDL have not been included as an evidence-based method of addressing the diverse needs of our clients, thereby undermining the responsibility of organizational health literacy. Providing UDL education and information to current occupational therapists could facilitate more effective and meaningful client education, resulting in higher achievement of positive outcomes, as envisioned by Levasseur and Carrier (2012). Skilled occupational therapists must address responsibility for client learning if client goals are to be fully achieved.

Intention and Practice of UDL in Occupational Therapy Practice

Occupational therapists are displaying enthusiasm and emphasizing the importance of content to engage their clients in learning; they are providing primarily verbal instructions to represent information to clients, and they are observing clients during activities or asking them to demonstrate learned skills to assess the clients' learning through action and expression. Although these educational processes are all based on the therapeutic use of self and other important skills of the therapist, they do not reflect the full and intentional use of UDL principles.

Teach-back strategies, as demonstrated by a study of nursing practice (Kornburger et al., 2015), may be a logical application of UDL into occupational therapy practice to improve client learning relevant to their performance of daily skills and generalization of learned information into valued occupations. Although this would require an increased commitment to repetition and exchange of information by occupational therapists, it would demonstrate improved organizational health literacy practices. Customized materials that use both pictorial and text content are also supported by literature (Benjaminsson et al., 2015; Maunder et al., 2009; Negarandeh et al., 2013). The barriers regarding the use of these approaches are similar to those for teach-back strategies.

While there are clear challenges to the use of UDL in occupational therapy clinical educational practices, there is also hope. The current study identified a level of commitment by the therapists to engage clients in problem-solving, engage children in games, and apply concepts to meaningful occupations. Hopefully, with support and resources, teaching methods for clients can be improved and health literacy can be addressed.

Primary to supporting occupational therapists may be continuing education in the principles of UDL and targeted methods to incorporate these practices in client education. As continuing education is used for ongoing certification and licensure, this may be sought by occupational therapists in many different practice settings and throughout their careers. Another potential support may be in the development of customizable client education materials that include pictures, text, and hi-tech or low-tech means to facilitate both engagement and representation of important information.

The concepts of UDL could be included in occupational therapy education so that as therapists enter the profession, they demonstrate greater awareness of UDL and commitment to client interventions and education that are consistent with multiple means of engagement, representation, and action or expression. Using these skills in preparation for practice may increase efficiency in incorporating these practices in occupational therapy client education. Finally, partnerships between professional preparation programs and practicing occupational therapists may allow for individual consultations to customize commonly used client education materials.

Limitations

A limitation of this study was that an accurate response rate could not be calculated as therapists could gain access to the survey through national professional forums and message boards. In addition, some UDL strategies that were being used by the respondents may not have been included in the survey. Although there was a write-in text box, decreased awareness of UDL principles may have prevented the respondents from adding these to the data set. Finally, the respondents may have answered the survey because of their familiarity with or commitment to UDL, which may have skewed the accurate representation of client education in occupational therapy practice.

Conclusion and Future Directions

The most notable finding of this study was that most occupational therapists are not capitalizing on the abundance of instructional methods and techniques available when applying the UDL framework to guide client education. Traditional methods used in client education lack a multi-faceted approach to the teaching-learning process that facilitates client understanding of their conditions, capacities, and potential outcomes of treatment. Occupational therapists have the unique ability to analyze activities, use assistive technologies, and modify and adapt equipment and environments to optimize function. However, there is a fundamental gap in therapists' knowledge of UDL principles and in translating information from the occupational therapist to the client in the most effective and efficient ways. Ultimately, these are missed opportunities that could otherwise foster well-being and occupational engagement in those we serve.

There are opportunities for improved client education materials, better implementation of the UDL framework, and, ultimately, improved organizational health literacy. For example, professional and pre-professional education of occupational therapists could include the UDL framework and strategies for implementation in different practice areas. There is also an opportunity to review and customize client education materials according to UDL principles, thereby customizing the learning experience to meet diverse learning and health literacy needs.

Primary recommendations from this study include improved professional and pre-professional UDL education and for customization of client education materials. Implementation of these recommendations would be important steps toward improved health literacy practices in occupational therapy. Partnerships between higher education and therapy settings could be important first steps toward the achievement of these goals. Finally, further research is needed to identify the effectiveness of these strategies.

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