Innovative Higher Education (2023) 48:371–388
https://doi.org/10.1007/s10755-022-09625-6

Faculty Motivation for OER Textbook Adoption and Future Use

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Accepted: 9 September 2022 / Published online: 20 October 2022

Abstract

Most postsecondary instructors in the United States require students to use textbooks in their courses; however, the cost of commercial materials has increased, and copyright policies impede sharing, editing, and customizations of materials. The current study aimed to examine faculty motivation to adopt Open Educational Resources (OER) and how OER use relates to effective teaching practices. Survey data from 469 professors, instructors, lecturers, and research scientists were analyzed using structural equation modeling, which found that autonomous motivation (engagement with OER textbooks based on enjoyment, value) was the strongest positive predictor of current and future OER textbook use. However, use of OER textbooks was not related to self-reported teaching success. The results of this study contribute to better understanding faculty perceptions of and motivation for OER textbook use, along with informing OER adoption initiatives at postsecondary institutions.

Keywords Open Educational Resources · Motivation · Faculty · Textbooks · Teaching

Postsecondary students are negatively affected by the high expense of commercial course materials in numerous ways. Higher education students spent an average of $1,200 on books and supplies in the 2018–2019 academic year (The College Board, 2019). Students who cannot afford the materials for multiple courses in each term may enroll in fewer courses, extending their time to graduation. Also, rather than personally having current versions of required textbooks, students may

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obtain outdated versions or share with peers to save money (Florida Virtual Campus, 2016). Students also search multiple stores and websites for lower prices to alleviate costs, distracting them from other obligations (Katz, 2019). Course material costs are also a significant source of stress for students across institutional types, this is an important factor when looking at the fit of OER material adoption for multiple higher education institutions and diverse student populations (Brandle et al., 2019; Murphy & Rose, 2018). From the faculty perspective, teaching is more difficult if students do not have reliable access to the assigned course materials or cannot have their materials with them in class (Watson et al., 2017). Moreover, copyrights on commercial materials typically prevent faculty members from adapting, customizing, and sharing resources (Hilton et al., 2010).

Open Educational Resources (OER) have been developed to address these challenges. OER are defined as:

> Teaching, learning, and research materials in any medium, digital, or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. (UNESCO, 2021, para. 1)

In addition to being available without fees to access (Smith, 2009), the open licensing of OER allows them to be customized, reused, and shared, affording faculty more freedom in instructional design (Feldstein et al., 2012). Based on systematic reviews of the literature, students surveyed in courses with OER reported that the quality of their OER to be comparable to commercial materials (Hilton, 2016, 2019). The findings of the surveys were similar for studies in which general impressions (e.g., "How would you rate the quality of the textbook in this course compared to textbooks in other courses?"; Bliss et al., 2013) or more specific aspects of quality (e.g., ratings of the helpfulness of figures and examples; Jhangiani et al., 2018). A meta-analysis comparing OER textbooks (i.e., open textbooks) to commercial textbooks found statistically equivalent learning performance, and students were less likely to withdraw from courses with open textbooks compared to commercial textbooks (Clinton & Khan, 2019). The findings in the meta-analysis did not vary if the studies examined controlled for student prior achievement or whether or not the same instructor taught the courses with OER and commercial materials (Clinton & Khan, 2019). However, there are numerous factors influencing students' grades and withdrawals that could not be fully accounted for in the meta-analysis. Despite these shortcomings, it is important to note that the meta-analytic findings demonstrate that, at the very least, OER are unlikely deleterious to student achievement (Clinton & Khan, 2019).

Several studies have examined factors that affect faculty adoption of OER for their courses. Cost savings is a clear motivator for OER adoption given faculty perception that high-cost commercial course materials are burdensome for students (Martin et al., 2017). Faculty also identify barriers to OER adoption as not knowing enough about OER or being able to locate appropriate OER materials (Belikov & Bodily, 2016), where only 46% of postsecondary faculty report being aware of OER (Seaman & Seaman, 2017). That said, faculty who are aware

of and adopt OER tend to view them as comparable in quality to commercial resources (Jung et al., 2017), perceive students using OER to be equally or better prepared for class (Hilton et al., 2018), and perceive student learning with OER as the same or better compared to commercial resources (Delimont et al., 2016). Faculty have also indicated that lacking institutional support, such as resources to find OER or explanations on licensing, is a barrier to OER adoption (Henderson & Ostashewski, 2018). Although these studies have been informative to understanding why faculty adopt OER, they have lacked a theoretical foundation. Such a foundation is critical to grounding future work in OER adoption in previous effective interventions as well as to connect to studies of motivation beyond open education.

We intend to address the need for a theoretical framework of faculty motivation for OER by applying *self-determination theory (*SDT; Deci & Ryan, 1985). SDT is among a variety of established motivational theories attempting to better understand faculty motivation including Eccles's Expectancy-Value Theory (MacDonald et al., 2014) and Vroom's Expectancy Theory (Estes & Polnick, 2012). Among the reasons for selecting SDT as an appropriate theory to understand faculty motivation for OER textbooks is SDT's established utilization in studies addressing faculty motivation for teaching, research, and professional development (Bouwma-Gearhart, 2012; Lechuga, 2012; Stupnisky et al., 2018, 2019). Ryan and Deci (2017) posited with SDT that different motivation types exist which differ in their degree of self-determination. *Autonomous* motivation is defined as task engagement because the individual perceives it as enjoyable (intrinsic motivation), satisfying, and/or valuable (identified motivation). Autonomous motivation results when three underlying psychological needs are satisfied: (a) autonomy*,* a sense of choice; (b) competence*,* a desire to interact effectively with one's environment; and (c) relatedness*,* experiencing close and secure emotional bonds with others. Applied to selection of OER materials, SDT suggests that faculty who feel autonomous (freedom to choose which text to use), competent (ability to find and integrate the new textbooks), and a sense of relatedness (feeling connected with students by reducing costs yet maintaining quality) will consider OER use to be valuable and satisfying, thus more likely to implement them. Using the SDT framework, we aim to identify specific areas where faculty motivation to use OER is lacking; for example, if faculty are choosing not to use OER due to a lack of competence, then training and guidance may address that need. If the psychological needs are not supported, SDT suggests faculty may still be motivated to adopt OER but for less optimal reasons, such as due to *introjected* motivation (to avoid guilt or shame) or *external* motivation (for social/financial rewards or to avoid punishment). Faculty could also display a lack of motivation or willingness to utilize OER materials, known as *amotivation*, which is an absent intention or interest (Ryan & Deci, 2000).

Faculty who are autonomously motivated to use OER may also utilize more effective teaching methods. Weller et al. (2015) found that faculty reported their teaching had become more reflective since adopting OER, one potential reason being that instructors have more flexibility when utilizing OER materials (Beaven, 2018; Mishra, 2017). Similarly, Stupnisky et al. (2018) found that faculty who reported more autonomy, competence, and relatedness felt more autonomously

motivated to teach, and in turn used more effective teaching strategies including instructional clarity. Although connections between material choice and teaching effectiveness are not well researched (Beaven, 2018), based on the above studies we hypothesize that faculty perceptions of OER autonomy, competence, and relatedness will foster their autonomous motivation to adopt OER, which will in turn enhance their use of effective teaching methods.

The Current Study

This study tested a hypothesized model, based on SDT, that faculty perceptions and motivation for current OER textbook use predicts current and future OER textbook adoption. With this model, the researchers also attempted to understand how SDT motivation types for OER textbooks and motivation for teaching could impact faculty self-reported teaching success and instructional clarity when controlling for current and future OER textbook use (see Fig. 1). Questions in an online survey measured latent constructs related to each variable in the hypothesized model, which were based on established scales and grounded in the theoretical and empirical literature reviewed above. Two primary research questions guided this study. First, how does faculty motivation for OER, as expressed in the SDT framework, predict current and future OER adoption? Second, how does faculty OER use relate to effective teaching methods, controlling for autonomous motivation?

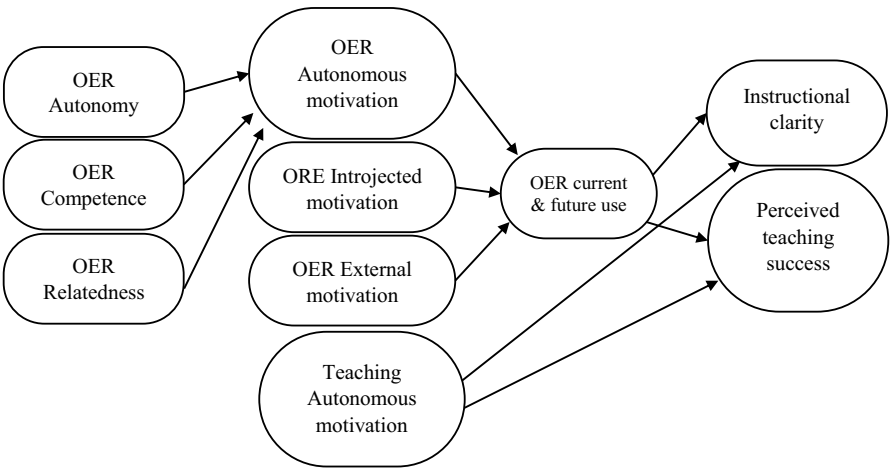

Fig. 1 Conceptual Model of Faculty Motivation, OER use, and Teaching Effectiveness. Note. Hypothesized positive relationships are shown with paths, but analyses would involve testing relationships among all variables

Methods

Participants and Procedure

Participants were faculty members recruited from public colleges and universities in the Midwest region of the United States during the spring of 2021. In total, 583 participants submitted survey responses with 469 completing 80% or more of the items for a completion rate of 80.4%. Finally, with data gathered from the National Center for Education Statistics, an estimated 1,787 full-time instructional staff received the survey via e-mail, with 583 participants responding for a total completion rate of 32.6%. Data from the 469 professors, instructors, lecturers, and research scientists were included in the final sample for analysis (demographics in Table 1). The sample gathered from this survey is reflective of national trends regarding faculty and full-time instructional staff in the United States with respect to demographic characteristics and representation of instructional ranks (e.g., assistant professor, associate professor, lecturer, etc.). Utilizing the current Basic Carnegie Classification system, most faculty participants were from R2 Doctoral Universities followed by Baccalaureate Colleges. Faculty were primarily women (58.2%) with an average age of 44.2 ($SD = 11.6$). Most faculty identified as white, and not of Hispanic, Latinx, or Spanish origin. Faculty of undergraduate students taught on average 3.76 ($SD = 2.99$) courses during the 2020–21 academic year, of which the format was on-campus face-to-face (17.0%), synchronous hybrid (29.4%), synchronous online (11.9%), and asynchronous online (20.3%).

Measures

OER Faculty responded to a series of single item questions on OER awareness, textbook selection, and future use, which were utilized or adapted from Seaman and Seaman (2017; see Table 2). Perceptions of quality or willingness to adopt OER textbook items were included from Jung et al. (2017), along with items measuring faculty perceptions of OER adaptability and ease of access from Pitt et al. (2020).

Basic Psychological Needs for OER Measures of the basic psychological needs for OER were adapted from Stupnisky et al. (2018). Twelve items representing the three needs measured the extent of faculty agreement on a 5-point scale (1 = *Strongly disagree*, 5 = *Strongly agree*) categories, for example: "I have a sense of freedom to make my own choices regarding open textbooks" (OER autonomy), "I can successfully complete difficult teaching tasks with open textbooks" (OER competency), and "I am close with people who are important to me when teaching (students, colleagues, etc.)"(OER relatedness).

Motivation for OER and Teaching Motivation for OER was adapted from Stupnisky et al. (2018) and measured faculty agreement on a 5-point Likert scale (1 = *Strongly disagree*, 5 = *Strongly agree*). A series of 18 items related to six SDT motivation types for OER

Table 1 Participant Characteristics

		Count	Percent
Gender Identity	Woman	273	58.21
	Man	185	39.45
	I prefer not to respond	8	1.71
	Another gender identity	3	0.64
Racial Identification	White	412	87.85
	Asian (e.g., Chinese, Filipino, Japanese, etc.)	33	7.04
	Black or African American	6	1.28
	American Indian or Alaska Native, White	5	1.07
	Asian, White	3	0.64
	American Indian or Alaska Native	2	0.43
	Other, please specify	2	0.43
	American Indian or Alaska Native, Black, or African American, White	1	0.21
	White, Other	1	0.21
Ethnicity	Not of Hispanic, Latinx, or Spanish origin	456	97.23
	Yes, of Hispanic, Latinx, or Spanish origin	5	1.07
	Yes, Mexican, Mexican American, Chicano	3	0.64
Primary Disciplinary Area	Health Related	78	16.63
	Social Sciences	70	14.93
	Other	67	14.29
	Education	43	9.17
	Physical Sciences	28	5.97
	Engineering	26	5.54
	Business	23	4.90
	Fine Arts	23	4.90
	Biological Sciences	21	4.48
	Mathematics or Statistics	20	4.26
	Agriculture or Forestry	19	4.05
	English	19	4.05
	History or Political Science	12	2.56
	Humanities	12	2.56
	Vocational	7	1.49
Academic Rank	Instructor	113	24.09
	Assistant Professor	112	23.88
	Associate Professor	98	20.90
	Other	67	14.29
	Full Professor	66	14.07
	Research Scientist or analyst	11	2.35
Tenure Status	Not on tenure track	218	46.48
	Tenured	153	32.62
	On tenure track, but not tenured	76	16.20
	Other	20	4.62
Institution Type	R2 (High Research Activity)	295	62.9
	Baccalaureate Granting Colleges	70	14.93
	Associates Granting Colleges	61	13.01
	Masters Colleges & Universities	43	9.17

Missing data was not included in the table, thus percentages may not total 100

textbooks were asked, including "I find using open textbooks exciting" (OER intrinsic), "Using open textbooks makes me feel proud" (OER identified), "If I don't use open textbooks I will feel bad" (OER negative introjected), "Using open textbooks boosts my self-worth" (OER positive introjected), "My work encourages me to use open textbooks" (OER external) and "I don't know a good reason to use open textbooks" (OER amotivation). The Autonomous OER motivation component of our proposed model is the result of combining OER Intrinsic and OER Identified items. This combination is the result of intrinsic motivation types resulting in autonomous motivation (i.e., self-determined), whereas external regulations (i.e., extrinsic, negative introjected regulation) can be combined as a controlled motivation component (Deci & Ryan, 2000). Motivation for teaching was measured by 12 items asking faculty "To what extent are the following reasons for why you teach in general?", such examples include "It is pleasant to teach" (Teaching intrinsic), "It is important for me to teach" (identified), "If I don't teach I will feel bad" (Teaching negative introjected), and "My work demands that I teach" (Teaching external). Autonomous motivation for teaching, is also a combined component of the proposed model merging intrinsic and identified motivation types for teaching.

Teaching Success Self-reported success in teaching was measured on a 5-point scale from Stupnisky et al. (2018; 1 = *Well below average*, 5 = *Well above average*) by asking faculty "Compared to the following, please rate your teaching success over the last year" on six items, example items included "Your own standards" and "Student evaluation of teaching". Instructional clarity included eight items on a 4-point scale (1 = *Very little*, 4 = *Very much*) (Faculty Survey of Student Engagement, 2016) and asked faculty "In your courses, to what extent do you do the following?", example items being "Clearly explain course goals and requirements" and "Review and summarize material for students".

Results

Rationale for Analyses

Data analyses were conducted in R (R Core Team, 2018). Study scales showed sufficiently normal distributions (i.e., skewness less than 2.3, Lei & Lomax, 2005; kurtosis less than 7.0, Byrne, 2013), and displayed good reliability (i.e., Cronbach's alpha adequate > 0.70, good > 0.80; Warner, 2012). To test the hypothesized model and address the research questions there were four levels of analysis. First, descriptive statistics were collected to understand both demographic information of the participating faculty and their perceptions/use of OER textbooks. Second, ANOVAs were employed to test mean differences between faculty members (e.g., faculty who are aware of OER, faculty perceptions of OER quality, faculty who would adopt OER versus not) SDT motivation types as they relate to awareness, perceptions, and utilization of OER textbooks. Third, correlations tested the strength of the linear relationship among SDT motivation types for OER, SDT motivation types for teaching, current graduate and undergraduate OER use, future use of OER textbooks, instructional clarity, and faculty self-reported perceived success in teaching. Fourth,

Table 2 OER Perceptions and Usage

Measure	Count	Percent
How aware are you of open textbooks?		
1 = I am not aware of open textbooks or OER in general	59	12.58
2 = I have heard of open textbooks, but don't know much about them	69	14.71
3 = I am somewhat aware of Open Textbooks, but I am not sure how they can be used	63	13.43
4 = I am aware of Open Textbooks and some of their uses	135	28.78
5 = I am very aware of Open Textbooks and know how they can be used in the classroom	142	30.28
What is your role in the selection of textbooks for your courses?		
1 = solely responsible	330	70.36
2 = lead a group that decides	18	3.84
3 = member of a group that decides	36	7.68
4 = influence the selection, but don't make decision	16	3.41
5 = no role	54	11.51
6 = other (please explain)	14	2.98
Based on your experience or your impression of open textbooks, how would you rate their quality?		
1 = BETTER than the quality of commercial textbooks	26	5.54
2 = About the SAME quality as commercial textbooks	158	33.69
3 = WORSE than the quality of commercial textbooks	101	21.54
4 = I do not know	183	39.02
I would adopt an Open Textbooks …		
1 = if the quality is HIGHER than Commercial Textbooks	73	15.57
2 = if the quality is EQUAL to the Commercial Textbooks	331	70.58
3 = I would adopt open textbooks regardless of the quality, even if its LOWER than commercial textbooks	36	7.68
4 = I would NOT adopt Open Textbooks regardless of the quality	24	5.12
A textbook that is adaptable or editable would be helpful for my teaching		
1 = Strongly disagree	23	4.90
2 = Disagree	33	7.04
3 = Neither agree nor disagree	125	26.65
4 = Agree	193	41.15
5 = Strongly agree	94	20.04
I would use Open Textbooks if they were easy to find for my subject		
1 = Strongly disagree	20	4.26
2 = Disagree	9	1.92
3 = Neither agree nor disagree	103	21.96
4 = Agree	188	40.09
5 = Strongly agree	147	31.34
Do you think you will use Open Educational Resources in the next three years?		
5 = Yes, I intend to	145	30.92
4 = I will consider it	112	23.88
3 = I may consider it	125	26.65
2 = Not interested	30	6.40
1 = No opinion / I don't know	54	11.51

Missing data was not included in the table, thus percentages may not total 100

Table 3 Descriptive Statistics and Reliabilities for Study Scales

Measure	# Items	*M*	*SD*	Range	Skew	Kurtosis	α
Basic Needs for OER							
Autonomy	4	3.36	0.68	1–5	-0.01	0.73	0.74
Competence	4	3.47	0.78	1–5	-0.08	0.29	0.83
Relatedness	4	3.11	0.62	1–5	-0.05	2.23	0.79
Motivation for OER							
Intrinsic	3	3.17	0.72	1–5	0.02	1.17	0.82
Identified	3	3.11	0.81	1–5	0.08	0.28	0.83
[1] Autonomous	6	3.14	0.72	1–5	0.09	0.87	0.90
Negative introjected	3	2.41	0.90	1–5	0.32	-0.19	0.89
External	3	2.44	0.78	1–5	0.10	-0.48	0.63
Amotivation	3	2.41	0.92	1–5	0.31	-0.32	0.77
Motivation for Teaching							
Intrinsic	3	4.50	0.58	1–5	-1.30	2.68	0.87
Identified	3	4.41	0.57	1–5	-0.78	0.16	0.74
[2] Autonomous	6	4.46	0.54	1–5	-1.00	1.41	0.89
Negative introjected	3	2.91	0.98	1–5	0.12	-0.39	0.77
External	3	3.65	0.91	1–5	-0.43	-0.38	0.73
Instructional Clarity	8	3.39	0.53	1–5	-1.10	1.85	0.85
Perceived Success in Teaching	6	3.74	0.67	1–5	0.01	-0.03	0.89

Autonomous motivation for OER (1) and autonomous motivation for teaching (2) are the sum of intrinsic and identified OER and teaching construct items

structural equation modeling (SEM) assessed regression paths between latent variables for both current and future OER use between SDT motivation types for OER, SDT motivation types for teaching, and self-reported perceptions of instructional clarity and teaching success in the proposed model. We utilized SEM because it allowed for the estimation of measurement error when analyzing latent variables, and to estimate multiple regression paths from multiple predictors to multiple outcomes simultaneously in our model (Byrne, 2013).

Preliminary Analyses

Descriptive statistics are provided for all averaged scales (see Table 3). Faculty perceptions of open textbook quality indicated that (39.2%) of faculty viewed open textbooks as being about the same quality or better than commercial textbooks, and (71.4%) of faculty displayed some form of agreement that they would use open textbooks if they were easily obtainable. Through crosstabulation, tenure-tracked or tenured faculty indicated that 32.2% would utilize OER in the next three years in comparison to 30.7% of non-tenured faculty. Among the non-tenured faculty 2.7% indicated they would not use OER in the next three years, whereas 9.2% of tenured or tenure-tracked faculty would also not utilize OER in the same timeframe.

Group Differences

ANOVAs revealed several statistically significant differences among faculty regarding their degree of autonomous motivation for OER. Those who were "very aware of open textbooks" ($M = 3.39$, $SD = 0.92$), compared to those who were "not aware" ($M = 3.02$, $SD = 0.52$), scored highest in autonomous motivation for OER, $F(4,437) = 6.38$, $p < 0.05$. Those who perceived open textbooks to be of "better quality than commercial textbooks" ($M = 4.13$, $SD = 0.84$), compared to those who viewed them as "worse" ($M = 2.97$, $SD = 0.51$), scored highest in autonomous motivation for OER, $F(3,438) = 57.1$, $p < 0.05$. Faculty who "would adopt open textbooks regardless of quality" ($M = 3.56$, $SD = 0.91$) scored highest in autonomous motivation for OER, $F(3,434) = 12.55$, $p < 0.05$, while those who indicated they would "not adopt open textbooks regardless of quality" ($M = 2.57$, $SD = 0.78$) scored lowest in levels of autonomous motivation. Finally, faculty perceptions of OER quality did not display statistically significant group differences with respect to self-reported autonomous motivation for teaching $F(3,438) = 1.50$, $p > 0.05$ or instructional clarity $F(3,441) = 1.06$, $p > 0.05$. Faculty perceptions of OER adoption also did not display statistically significant differences in means among the groups with respect to autonomous motivation for teaching $F(3,435) = 0.157$, $p > 0.05$.

Correlations

Correlations revealed motivation for OER use aligned expectedly with assertions of SDT (Table 4). One example is the moderately large positive correlations found among autonomy, competence, relatedness, and autonomous motivation for OER. Autonomous motivation for OER also had a moderate positive correlation for current undergraduate faculty OER textbook use and future OER textbook use. Although autonomous motivation for OER was not statistically significantly correlated with perceived teaching success and clarity; autonomous motivation for teaching showed a small positive correlation with perceived teaching success, and a moderate positive correlation with instructional clarity. External motivation for OER also indicated a weak positive correlation with the future use of OER textbooks.

Latent Variable Analyses

Latent variable analyses were conducted using the R lavaan package for structural equation modeling (Rosseel, 2012). Goodness of fit were aligned with the following measures: chi-square (χ^2), root mean square error of approximation (RMSEA < 0.08 indicating acceptable model fit, Browne and Cudeck, 1992; < 0.10 MacCallum et al., 1996), comparative fit index (> 0.95 indicates well-fitting model, < 0.90 requires re-specification; Hu & Bentler, 1999), and standardized root means square error (SRMR < 0.05 indicating the model as appropriate, Byrne, 2013; < 0.08, Hu & Bentler, 1999; < 0.10 Kline, 2005). A confirmatory factor analysis including all study multi-item measures as latent variables showed sufficient goodness-of-fit to the data, $\chi^2(983) = 1830.72$,

Table 4 Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. OER Autonomy	-														
2. OER Competence	.58**	-													
3. OER Relatedness	.65**	.57**	-												
4. OER Autonomous Motivation	.58**	.69**	.63**	-											
5. OER Introjected Motivation	.29**	.32**	.41**	.54**	-										
6. OER External Motivation	.16*	.10	.30**	.18*	.33*	-									
7. OER Amotivation	-.39**	-.54**	-.37**	-.55**	-.28**	-.14	-								
8. Teaching Autonomous Motivation	.20**	.16*	.13	.13	-.05	-.09	-.11	-							
9. Teaching Introjected Motivation	.17*	.11	.18*	.15	.26**	.08	.05	.27**	-						
10. Teaching External Motivation	.06	.02	.04	.00	.03	.11	.06	.01	.20**	-					
11. Current Undergrad OER Use	.32**	.44**	.33**	.40**	.24*	.12	-.37**	-.01	.16	-.01	-				
12. Current Grad OER Use	.25	.36**	.38**	.38**	.20	.09	-.24	-.12	.00	-.06	.40**	-			
13. Future OER Use	.37**	.48**	.32**	.47**	.24**	.17*	-.55**	.19**	.08	.10	.50**	.29	-		
14. Instructional Clarity	.12	.07	.07	.08	-.03	-.01	-.05	.42**	.09	.08	-.03	.15	.18*	-	
15. Perceived Success in Teaching	.09	.05	.07	.02	-.03	.03	.03	.26**	.12	.05	-.05	.16	.08	.40**	-

*$p < .05$, **$p < .01$

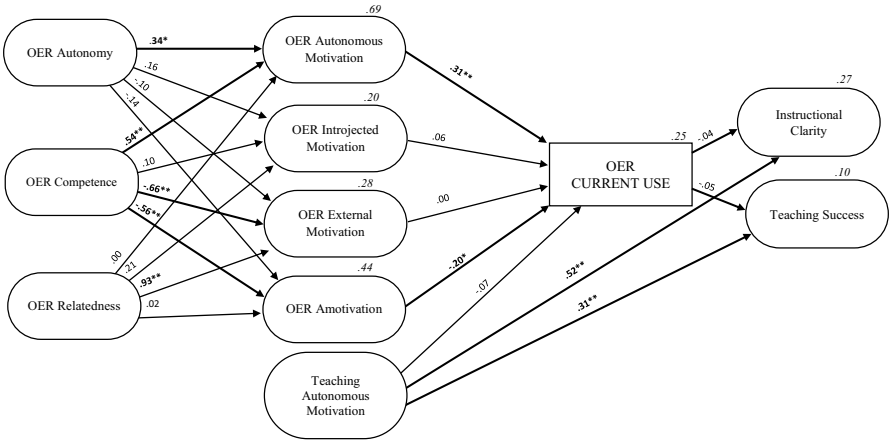

Fig. 2 Structural Model of Faculty Motivation for Current Use of OER and Teaching Success/Instructional Clarity. Note. Standardized regression coefficients appear on respective lines, with bolded paths and coefficients significant at * $p < .05$, ** $p < .01$. R-square appear above right corner of endogenous variables. Analyzed sample was 222. Model goodness of fit: Chi-square (1037) = 1674.99, $p < .05$, CFI = .90, RMSEA = .053, SRMR = .069

RMSEA = 0.048, CFI = 0.915, SRMR = 0.059, as well as strong item-to-factor loadings and most AVEs > 0.50 supporting convergent validity (Hair et al., 2010).

Two structural models tested the hypothesized model which were different based only on the final endogenous (outcome) variable of current (Fig. 2) vs. future OER use (Fig. 3). Both models showed OER competence and autonomy positively predicted autonomous motivation for OER (engagement with OER textbooks based on enjoyment, importance). In turn, autonomous motivation for OER was the strongest positive predictor of OER use, even after accounting for autonomous motivation to teach. On the other hand, amotivation for OER (no motivation) was the strongest negative predictor of OER use, which was preceded mainly by a lack of OER competence. Faculty who reported a greater sense of relatedness to students when using OER, and a lack of competence in OER, reported more motivation to use OER based on guilt (introjected) and rewards (external); however, those motivation types were not associated with current or future OER use. Finally, intended future OER use was positively related to instructional clarity, although current OER use was not strongly related to self-reported teaching success.

Discussion

The aim of the current study focused on two primary research questions: how do components of faculty motivation for OER, as articulated in the SDT framework, predict OER use? How does faculty OER use relate to effective teaching methods, controlling for autonomous motivation? Descriptive statistics revealed that most faculty were aware of open textbooks and their potential uses (59.06% aware or very

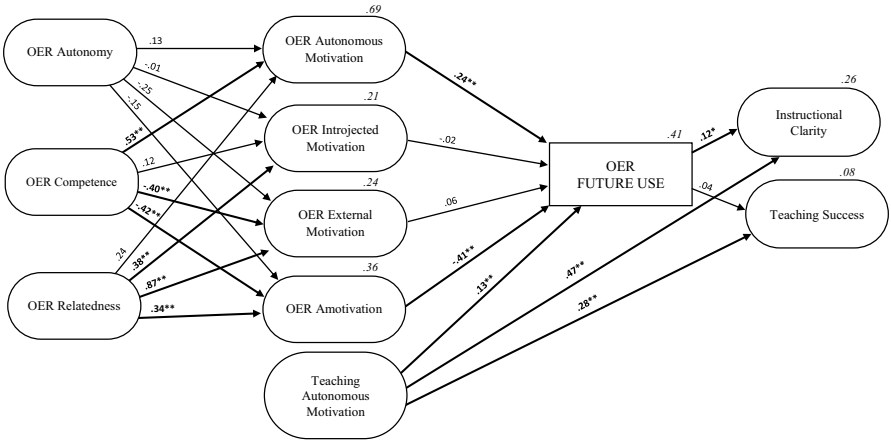

Fig. 3 Structural Model of Faculty Motivation for Future Use of OER and Teaching Success/Instructional Clarity. Note. Standardized regression coefficients appear on respective lines, with bolded paths and coefficients significant at * $p < .05$, ** $p < .01$. R-square appear above right corner of endogenous variables. Analyzed sample was 377. Model goodness of fit: Chi-square (1037) = 1906.91, $p < .05$, CFI = .91, RMSEA = .047, SRMR = .060

aware of OER textbooks), a slight increase from the results of Seaman and Seaman (2017), indicating a potential growth in faculty awareness of OER textbooks. ANOVA results uncovered that faculty with the highest levels of autonomous motivation for OER were the most aware of OER textbooks, perceived OER textbooks to be of better quality than commercial textbooks and would adopt OER textbooks regardless of quality. However, only 39.2% of the total faculty surveyed viewed OER textbooks as the same quality or better than commercial textbooks. This could be due to limited faculty exposure to OER materials or a variety of external factors such as institutional textbook adoption protocol.

The current study provides strong support for the applicability of self-determination theory (Ryan & Deci, 2017) in future studies aimed at understanding what motivational factors contribute to current and future adoption of OER materials. Autonomous motivation was positively predicted by both competency and autonomy. This suggests that faculty who feel competent in their ability to identify and use OER textbooks, along with those who feel a sense of freedom in their selection and utilization of OER textbooks, were more autonomously motivated. These results also connect with previous findings (Belikov & Bodily, 2016; Elder et al., 2020) in which faculty mention barriers of not knowing enough about OER textbooks or where to locate them. Therefore, faculty who are better informed (competent) for OER textbooks would be more autonomously motivated to utilize them, as supported by the descriptive statistics where most faculty displayed some form of agreement in using open textbooks if they were easy to find for their respective subjects. The results supporting autonomy of faculty in textbook selection also speaks to the results of Henderson and Ostashewski (2018) who found faculty cited a lack of institutional support as a barrier to OER adoption. Institutional initiatives should therefore implement practices which promote faculty

autonomy in OER textbook selection, such as workshops centered on identifying OER materials and best practices to implement them within their courses. The null effect of relatedness in predicting current and future OER use could be the result of a variety of factors. While there appears to be a potential growing awareness of OER materials, it is not to the level of widespread shared positive sentiment among colleagues or administration which would affect faculty motivation to adopt OER materials based on peer activity.

Student interaction could also play a role in faculty relatedness to OER, as positive student sentiment and outcomes for OER in other courses could translate to faculty adoption of such materials. Further efforts to support institutional OER adoption could establish or provide resources to student led initiatives, which have been suggested as an important component of previous institution wide OER initiatives (Allen et al., 2019). Such initiatives to implement OER have been recognized as important to student cost reduction initiatives like that at Portland State University (Moody, 2015), where among the recommendations for adoption of OER were the development of incentives for faculty to expand the use and creation of OER materials and textbooks, along with seeking grants to support course redesign utilizing OER.

SEM results indicated that faculty who were autonomously motivated for OER were most likely to exhibit current or future OER use. SEMs also showed faculty OER use was not strongly related to self-reported teaching success, which further adds to a lack of connection between course material choice and teaching effectiveness (Beaven, 2018). The intended future use of OER, however, was positively related to a faculty members self-perceived sense of instructional clarity.

Limitations and Future Directions

There are several limitations and considerations to identify in this study. First, the study collected and analyzed faculty self-reported teaching success and instructional clarity, which may contain social-desirable responses. Future studies could utilize external sources of reported teaching success based on student-reported feedback. Second, the timeline of this study posed the survey during the ongoing Covid-19 global pandemic (January 2021) and therefore could garner different results (such as percentages of faculty course delivery types) based on a higher education landscape in a pre-pandemic world. The authors also recognize that further research should be done to explore institutional policies and academic disciplines as factors that relate to faculty perceptions and ultimately adoption of OER materials. More so, attention should be brought to global initiatives such as the OER World Congress and the Paris OER Declaration (Pawlowski & Hoel, 2012); which created an action plan aimed at increasing access to OER, and more so making decision makers in government more informed on OER availability and possibilities across levels of governance. Lastly, with a majority of the respondents identifying as White professors, instructors, lecturers, and research scientists there should be further research done to understand the results of this study in a more diverse sample.

Conclusion

Results of this study contribute to the existing literature on faculty perceptions and adoption of OER resources while utilizing a theoretical framework of self-determination theory, which could be integrated in future OER studies (Ryan & Deci, 2017). This study also benefits higher education institutions and students by identifying factors which are important to faculty in their perceptions and adoption of OER materials, therefore, alleviating some of the financial burden students face with high-cost commercial materials. Based on our results, institutions of higher education who wish to implement or further utilize OER initiatives could focus on both increasing awareness of OER materials, and support faculty sense of autonomous (intrinsic) motivation for both textbook selection and use of OER materials in their respective courses.

Funding This study was supported by the Rose Isabella Kelly Fischer Professorship award.

Declarations

Ethical Approval and Consent to Participate The authors of this study received institutional review board (IRB- 202010-054) approval prior to data collection from all participating institutions. Participants provided informed consent digitally before completing the survey and were given the option to provide confidential e-mail addresses for a drawing of gift cards.

Conflicts of Interests The authors have no competing interests or declarations that are relevant to the content of this study. The authors also certify that they have no affiliations with or involving any organizations or institutions that have financial interest in the subject matter of the study, nor the results. The authors also have no fiscal or proprietary interest in the material discussed in this study.

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